IDX Imagecast™ iPACS®

User Manual

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Contact Information

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Guide Conventions

User input	This manual uses **bold** text to indicate user input. For example: Enter **T** to specify today. This indicates that you must type T and then press ENTER on the keyboard.
Key names	A specific key on the keyboard is indicated in all caps (capital letters). For example: Press ENTER to submit your password. This indicates that you must press the ENTER key on the keyboard to perform the specified task.
System prompts and messages	System prompts and messages in text are shown in *italics* as follows: *No Information Found*. This indicates that the words "No Information Found" are displayed in the application.
Field labels	Fields that require input or item selection appear in **bold** text. For example, "In the **Attending** field, select a provider." This indicates that the word "Attending" is a field label in which users must enter the name of the attending provider.
Buttons	Button names appear in **bold** text. For example: Click **Save**. This indicates that the word "Save" is the button name and the user must click this button on the window. Button names are also shown in bold text when used in a sentence, as follows: The **Save** button allows you to save information entered on the window to the Imagecast database.

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Check boxes and radio buttons

Check box (☐) and radio button (○) names appear in **bold** text. For example, ☐ **Save to Report Directory**.

Radio buttons are round buttons used to select (◉) one of a group of mutually exclusive options. Check boxes are square boxes that are selected to turn on (☑) or cleared to turn off (☐) an option. More than one check box can be selected.

Radio buttons and check boxes are sometimes referred to as *flags*, as they indicate whether or not an option is selected.

Pressing keys simultaneously

This manual uses the following format to indicate that you must press two keyboard keys simultaneously to perform the specified task: SHIFT+F5. This indicates that you must press and hold the SHIFT key, and then press the F5 key on the keyboard to perform the specified task.

Icons

Icons are used to indicate important messages or information. These icons indicate Notes, Examples, Cautions, and Warnings as follows:

This is the Notes icon. Notes alert you to specific points of interest. Notes that appear in procedural tables are preceded with the word Note or Notes, as appropriate. Procedural table notes are not marked with icons.

This is the Example icon. Examples contain information about how you can use certain features of Imagecast applications.

This is the Caution icon. Cautions indicate danger to the integrity of the data. Cautions that appear in procedural tables are preceded with the word **Caution**.

This is the Warning icon. Warnings indicate danger to a patient.

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Proper Usage of Imagecast Products

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Overview

Imagecast medical software applications aid in the delivery of healthcare by assisting authorized personnel in their daily workflow and by assisting qualified providers in the interpretation of medical data.

To ensure proper use of the system, users should read the product manuals and receive training. Certain sections of Imagecast products are of particular importance and can pose a potential problem if users are not properly trained.

The following sections describe:

- The responsibilities of you, the customer, and IDX regarding potential issues
- Cautions to alert you to potential issues on which to focus during training and regular use of the system

If you do not understand these responsibilities and cautions or how they affect you, contact your Imagecast application manager or the Imagecast Support Center.

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Imagecast™ iPACS Image Viewer Safe Usage Statement

The Imagecast™ iPACS Viewer should be used by a licensed radiologist or cardiologist. If utilized by a non-radiologist/cardiologist, it should be in conjunction with a primary diagnosis report or during a consultation with a licensed radiologist/cardiologist.

The monitor should be properly configured, calibrated and placed in a location without direct sun or lighting.

The computer needs to be inspected by the system administrator on a periodic basis to verify proper operation.

Safe Usage Environment

Your hardware for operating the viewer must be approved by IDX and maintained in accordance with the manufacturer's specifications.

Prior to using Imagecast™ iPACS Viewer, your computer system must be set up in the proper environment for viewing images and you must ensure that your computer monitors have been properly configured. To configure your monitors, carefully follow the monitor manufacturers' specifications and/or instructions for monitor calibration. If the monitors used in conjunction with Imagecast™ iPACS Viewer are not properly calibrated, Imagecast™ iPACS Viewer has not been properly configured and should not be used to render clinical diagnoses.

When Not to Use Imagecast™ iPACS Viewer

Do not use this product if:

- You know that the computer system you are using is clearly malfunctioning.
- Your application manager instructs you not to use the application.
- An error or warning message is displayed by the application.
- You are aware of any system problems or malfunctions. Always notify your application manager of any potential system problems or availability issues as soon as possible.

Never render a primary diagnosis on images if you are using a monitor that was not certified or calibrated for diagnostic purposes.

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Responsibilities

Both you, the customer, and IDX share in the responsibility of ensuring that potential problems encountered with the software are addressed in a timely fashion. As a customer, you are responsible for reporting any and all potential problems you encounter with Imagecast applications.

Your Responsibilities

When you, the customer, encounter a potential problem with the software, you need to report the issue to IDX in a timely fashion. The following steps should be performed when reporting an issue to IDX:

1. You should write down the accession or document identification number related to the problem, a description of the problem, and contact your application manager immediately.
2. The application manager contacts the Imagecast Support Center and reports the problem and accession number or document id number.
3. The application manager notifies all users to stop using the affected function immediately.
4. All suspect patient and exam/report records should be carefully scanned by the application manager for problems.

IDX Responsibilities

Once IDX is contacted about potential issue, we will do our best to resolve it in a timely manner. IDX performs the following steps when notified of an issue regarding a potential issue:

1. IDX determines the nature of the reported problem by attempting to recreate the problem at IDX.
2. If it is determined that no problem exists, the organization is advised to resume normal procedures. IDX carefully documents all steps taken.
3. If it is determined that a problem exists (that is, the problem reported is not due to user error), IDX advises the application manager to stop using the affected function.
4. IDX resolves the issue and carefully documents all steps taken.
5. IDX notifies the application manager that users can resume using the affected function.

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Introduction

iPACS® is a state-of-the-art PACS that enables viewing lossless images in real-time. The iPACS server processes the study images from the PACS archive in virtually 'real-time'. The iPACS server streams the study to the user's iPACS Viewer using Imagecast™ Pixels-on-Demand™ technology.

iPACS enables the Radiology Department to share images with others who need them, such as consulting specialists and referring physicians, in real-time and with lossless quality, regardless of the user's bandwidth.

Imagecast™ iPACS Viewer includes the following features:

- Image Preview Pane
- Study Information
- Series Display Modes: Page, Stack, or Cine
- Customized Window Width and Level
- Pan, Zoom, Flip, and Rotate
- Magnifinder™
- Qualicator™
- Measurement Tools
- Hanging Protocol
- Localizer (optional)
- Cut Lines
- Link Series
- User Preferences
- DICOM Print (optional)
- Multi Monitor Support (optional)
- Study Report
- Annotations
- Save as DICOM (optional)
- Orthopedic Module (optional)
- Cardiology Module (optional)
- Diagnostic Workstation (optional)
- CD Burn (optional)

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Terminology

Common terms are used throughout the Imagecast™ iPACS viewer when referring to selecting and reading exams. In order to better understand Imagecast™ iPACS viewer functionality, refer to the following table.

Common Imagecast Cardiology Viewer Terminology

Term	Definition
Image Preview	Initial preview representation of the image/series that opens in the preview pane. Use this preview to select specific series, or slices in a series to view, and pan on an image.
Image	A single 2D image, such as a SC, CR, XR, or DR. Double clicking the preview opens the image in main view, where it can be manipulated, orientated and measured.
Series	A succession of the slices that belong to the same orientation, frame of reference and imaging parameters, from MR or CT. Double clicking the preview opens a number of slices in the main view, depending on the preset series layout. Page, Stack and Cine modes are available.
Study	A single or group of images/series acquired in a single procedure for the same patient. All images and series for that study are opened in the preview pane for easy selection and viewing.

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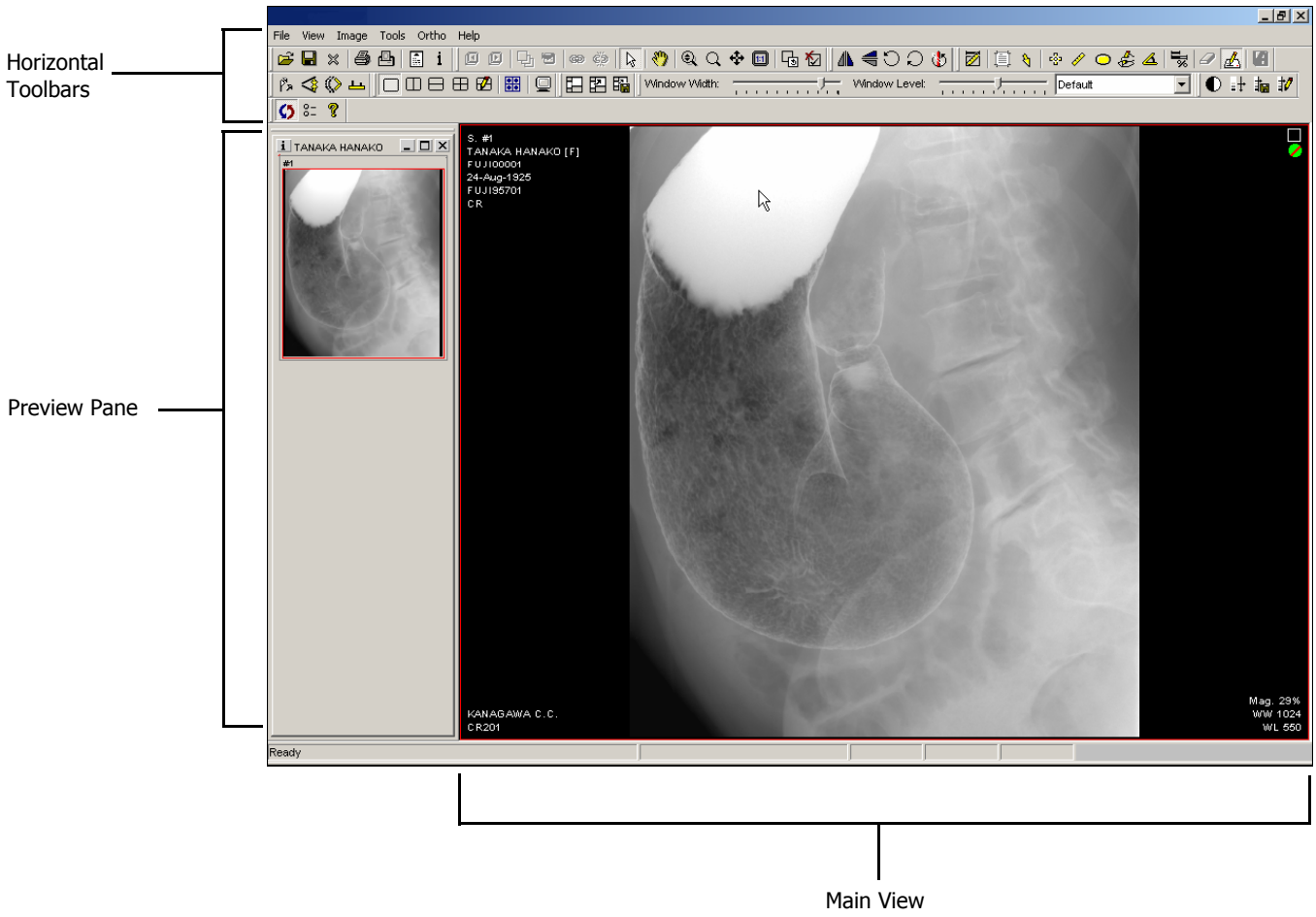
Getting Started

After a study has been selected from the worklist, the Imagecast™ iPACS Viewer automatically opens the images for that patient. The Imagecast™ iPACS Viewer displays the study's previews on the preview pane on the left hand side of the screen and the images are opened in the main view according to the default hanging protocol. To open another image in the main view of the viewer, double-click or drag on the preview you want to select. Refer to the graphic below



Horizontal Toolbars

The horizontal toolbars contains the main menu bar and the toolbars used for image manipulation and analysis.

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Preview Pane

The preview pane contains the preview thumbnail images/series of the studies.

Main View

The main view displays the expanded images/series of the studies.

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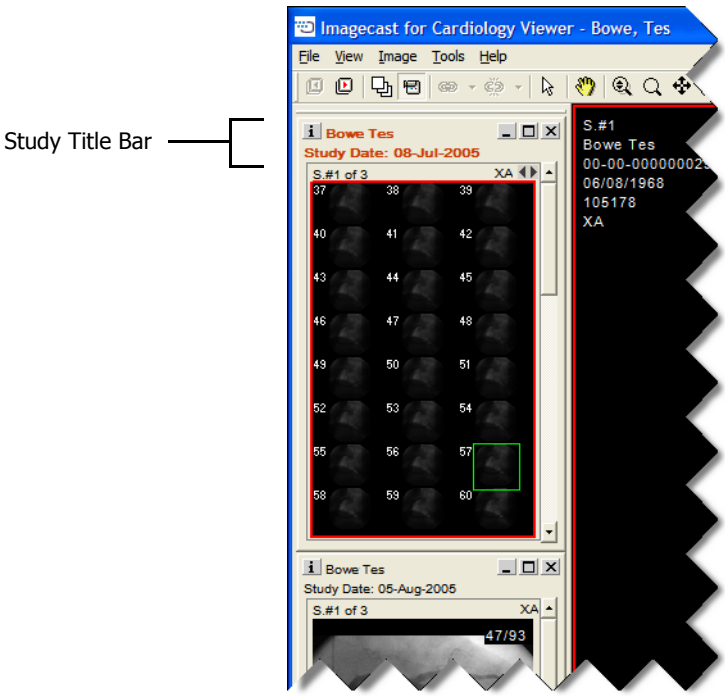
Preview Pane Navigation

Use the Study Title Bar found at the top of each study preview to open, close and cascade thumbnail images in the preview pane.



The Study Title bar consists of the following:

- Study Info—opens study info dialog box
- Patient Name—displays the patient's last name. The tool tip on the Patient Name also displays Study Info.
- Study Date—displays the date of study acquisition
- Minimize—closes any open previews, study minimized to a single title bar in the preview pane
- Cascade—opens the thumbnail images in the preview pane, by dividing the length of the preview pane among the various opened studies
- **Maximize**—opens all preview images of the study the length of the whole preview pane, minimizes all other studies
- **Close Study**—closes the study and removes it from the preview pane

For the active study, the Patient Name and Study Date will be in red and the thumbnail will be enclosed by a red square.

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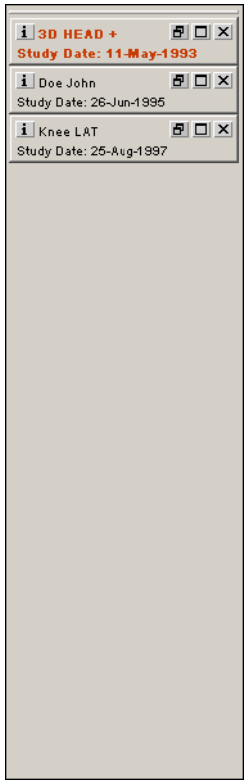
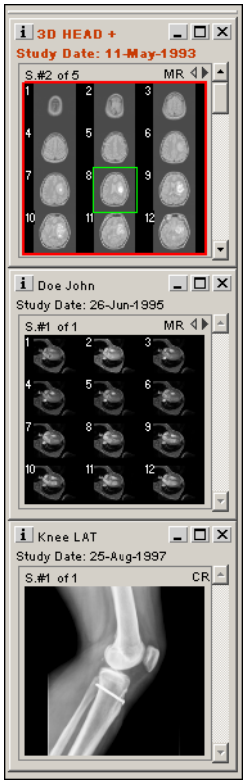
Different Preview Pane states are shown below:

Minimize All



One Thumbnail Cascaded

All thumbnails maximized



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Displaying Images

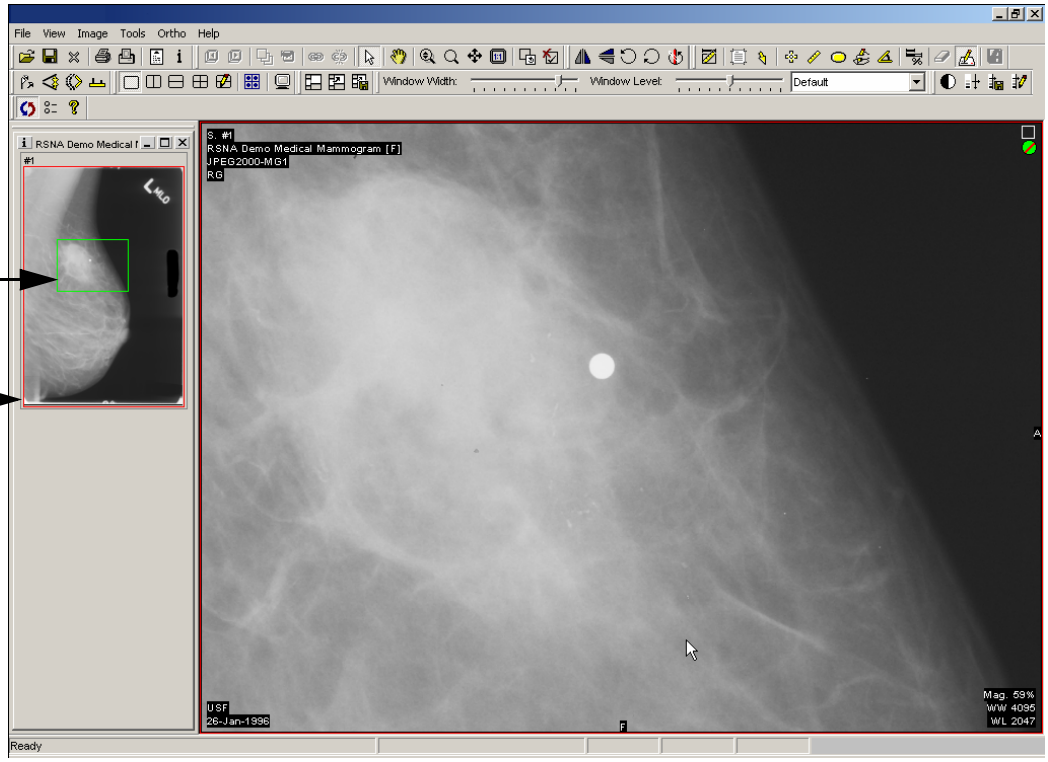
Displaying Single Images

To display a single image, double click or drag the preview image into the main view. In single images, the ROI (Region of Interest) that is displayed in the main view is indicated on the image preview by a green rectangle. The active image is indicated by a red rectangle around the image preview.

You can change the magnification of the image in the main view using the Zoom tool .

Region of Interest (ROI) indicated by green rectangle

Active image indicated by red rectangle



On the image preview, the cursor changes to the hand tool allowing you move the ROI (green rectangle) to pan across the image. To move the ROI, click and hold the green rectangle and move it across the image preview. The ROI displayed in the main view changes appropriately. You can also pan directly on the main view using the Pan (hand) tool.

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Displaying Series

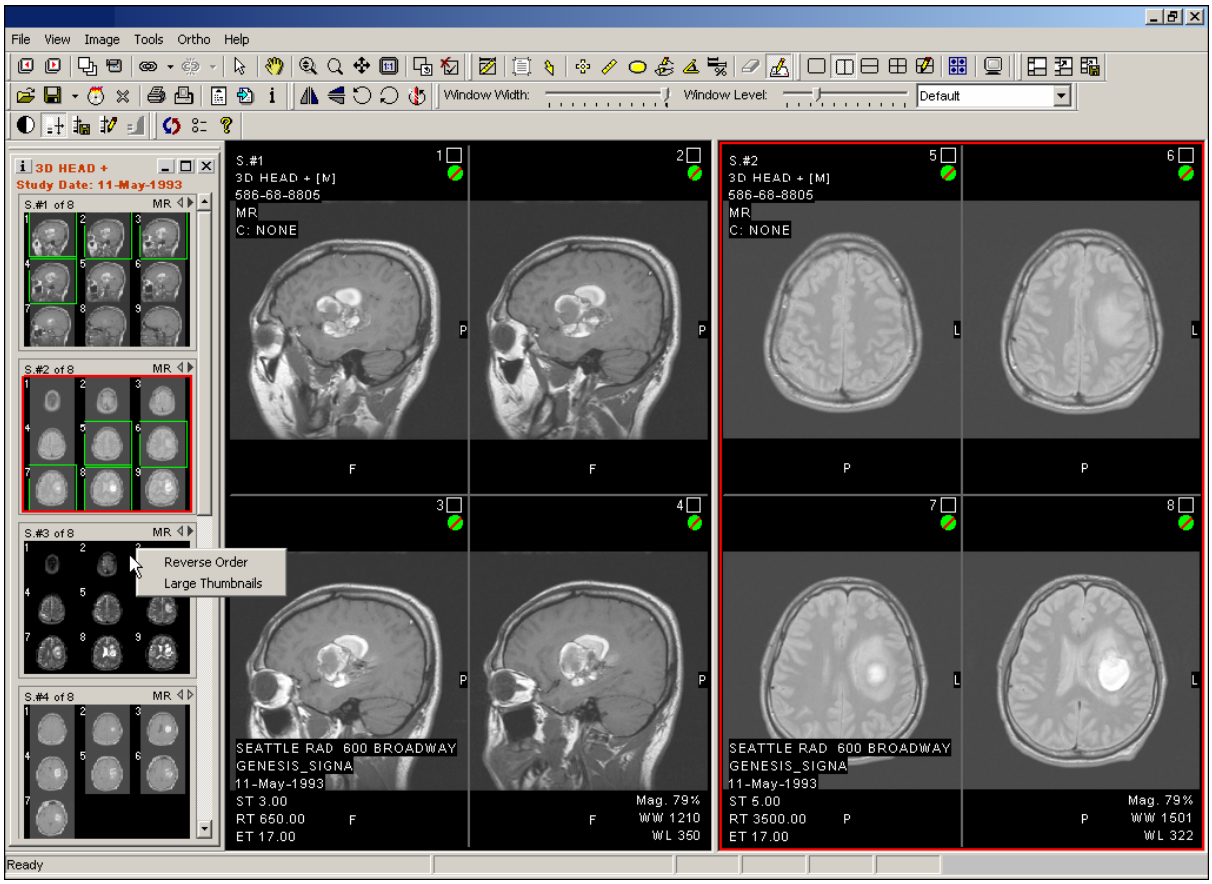
To select a series, double click or drag the desired slices in the preview pane. The active series is indicated by a red rectangle around the image preview.

The series is opened in the main view, according to the preset screen layout as defined in the applied Hanging Protocol (1x1, 1x2, etc). The screen layouts allow opening multiple series on the same screen for series or study comparison.

The series layout determines how many slices of the series will be displayed at the same time. Default series layout is set according to the applied Hanging Protocol.

In a series, the selected slices are indicated on the image preview by adjacent green rectangles. These rectangles indicate which slices of the series are currently being displayed in the main view.

You can also temporarily reverse the order of the slices of the study displayed. Right click on the series in the preview pane, and select Reverse Order for that series.



Screen Layout 1x2 Series Layout 2x2

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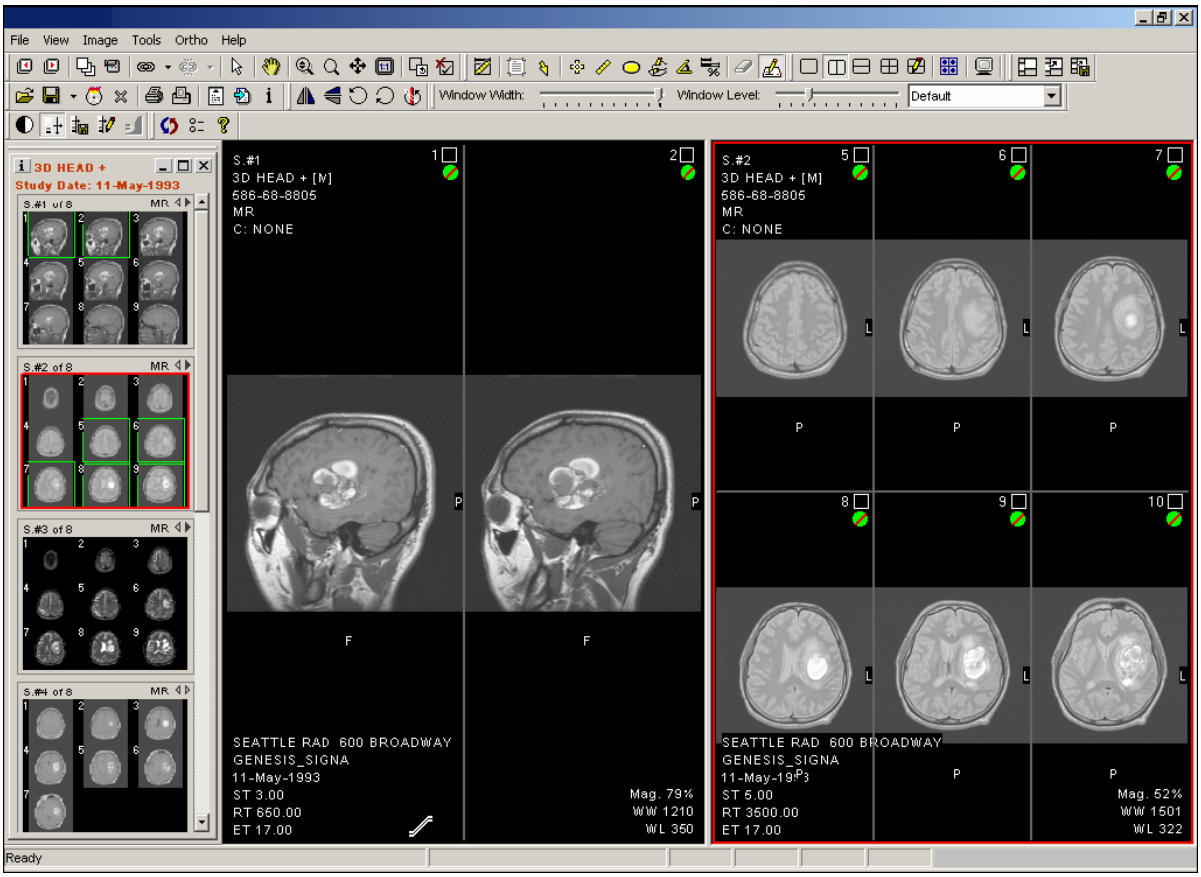

Screen Layout 1x2 Series Layout 1x2 and 2x3

Displaying in the Main View

When an image preview is selected, it opens in the main view. (Default screen layout and default series layout are according to the applied Hanging Protocol.)

In the main status bar below the image, a Streaming Progress Status Bar appears, showing the progress of the received image data. The image's quality is improved as data continues to stream, until the highest possible quality is achieved.

In the upper right hand corner of the image or of each series, a Qualicator™ displays the current image quality. There is also a checkbox used to select images for DICOM Print and Save.

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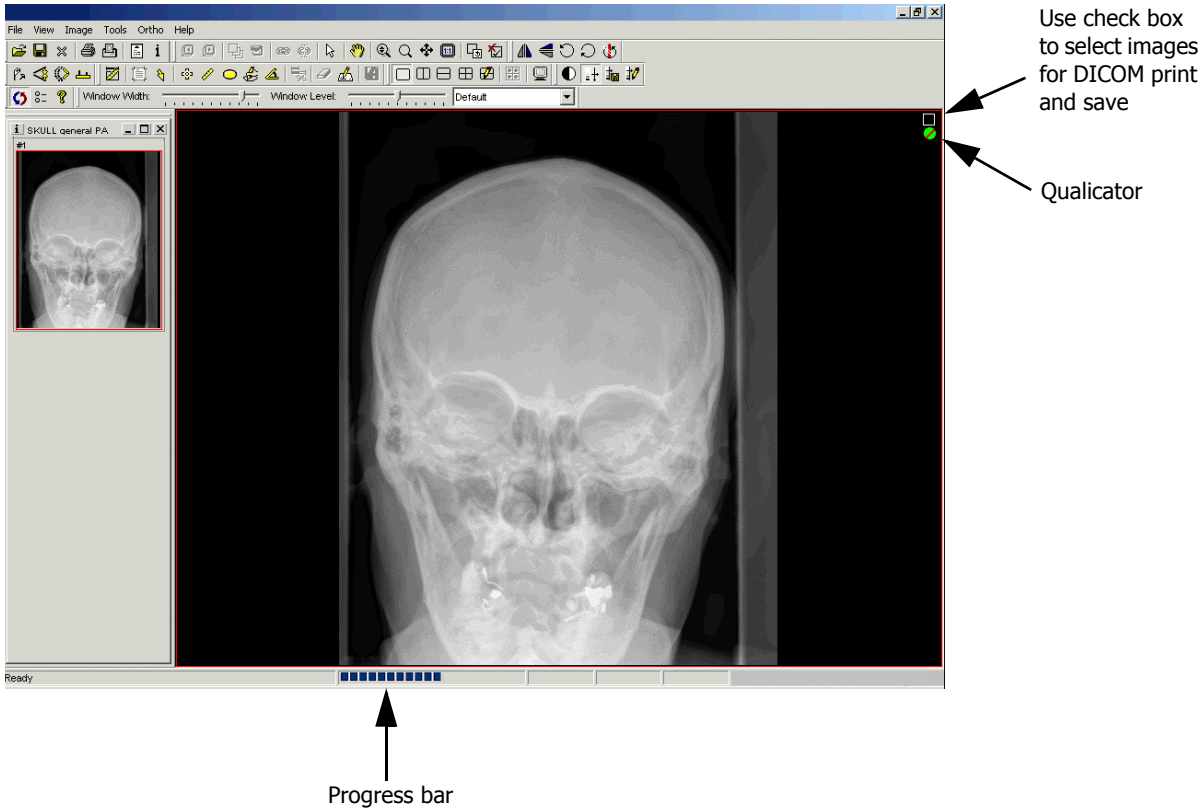
In the lower right hand corner of the image, the Magnification Level of the image is also indicated, as well as Calibration, and Linked Group number.



Displaying Images Full Screen

To open the image full screen, double click on the main view, or press on Enter, or right click to open the pop up menu and choose **Full Screen**, or click on the Full Screen button . The image is displayed without the toolbars, using the whole screen area for maximal display.

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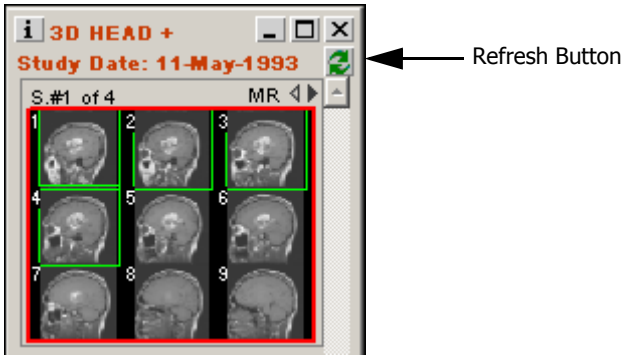
To return to the previous state of the Viewer, double click on the image again, or press on Enter, or right click to open the pop up menu and choose **Return to Main View**.

Updating Images

Study content can change for several reasons:

- A new series is added to the study
- A study demographic is changed by quality control (QC)
- A secondary capture (SC) is added to the study
- An annotation (GSPS—presentation state) is added to the study

If study content changes on the server while a study is being viewed, an Refresh button will appear on the thumbnail of the specific study and a message will be shown.



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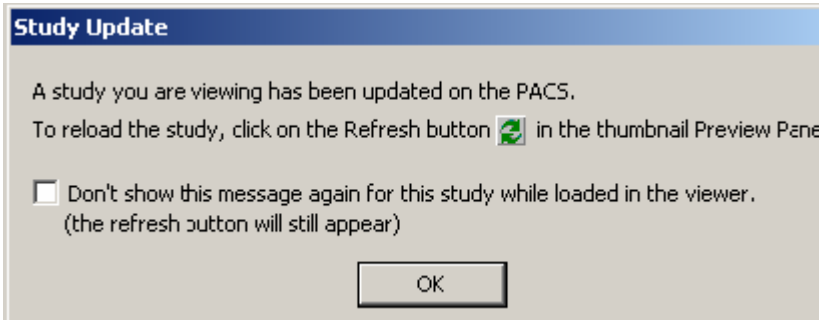

Click **OK** to close the message box. Then click on the Refresh button to reload the study.

To manually refresh all studies opened in the viewer

You can also manually refresh all studies opened in the Viewer, by choosing **File** > **Refresh All Studies** from the menu. All opened studies will be closed and reloaded from the server.

Using Toolbars

The toolbars provide quick access to all of the iPACS Viewer's functions.

Toolbars Available in the iPACS Viewer (Page 1 of 2)

Description	Toolbar
File Enables you to open local studies, save, burn to CD, close all studies, windows print, DICOM print, open study report, set next status, and open information.	
Image Manipulation Enables you to scroll between series, enable stack mode, run cine, link and unlink series, select, pan, zoom, magnify an area, fit to screen, change to 1:1 resolution, restore original, and unselect all images.	
Image Orientation Enables you to flip the image vertically and horizontally, rotate left or right, and reset to original orientation.	

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Toolbars Available in the iPACS Viewer (Page 2 of 2)

Description	Toolbar
Annotations Enables you to calibrate images, create text annotations, draw arrows, measure pixel intensity, measure Line, measure ellipse, draw freehand, measure angle, measure Cardio Thoracic ratio (optional), delete, display/hide, and save annotations.	
Ortho (optional) Enables you to open Orthopedic Templating, measure the angle between two lines, Cobb angle, and Transischial line.	
Screen Layout Enables you to customize the layout of images in the main view, change series layout, and open images full screen.	
Hanging Protocol (optional) Allows you to open Hanging Protocol tab, apply Hanging Protocol, and save as Hanging Protocol.	
Window Sliders Allows you to control the Window Width and Window Level displayed on the monitor and select the Modality Window Presets.	
Windowing Enables you to invert color, change to windowing cursor, save current windowing as preset, edit windowing and apply original LUT	
Settings Enables you to open Streaming Mode tab, open Settings dialog, access the online Help, and About.	

By default, the Viewer opens with only the Image Manipulation, Annotations, Screen Layout, and Hanging Protocol.

Every toolbar can be customized according to your preferences. They can be turned on or off, moved to a different location, or floated above the application.

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To Turn Off a Toolbar:

1. Click on **View** >**Toolbars** in the main menu.
2. Uncheck the toolbar you want to turn off.

To Arrange Toolbars:

1. Click on **View** > **Toolbars** > **Arrange Toolbars**.
2. Select to arrange the toolbars to the Top, Left, Bottom, or Right of the Main View.

Toolbar on top

Toolbar on left

Toolbar on bottom

Toolbar on right

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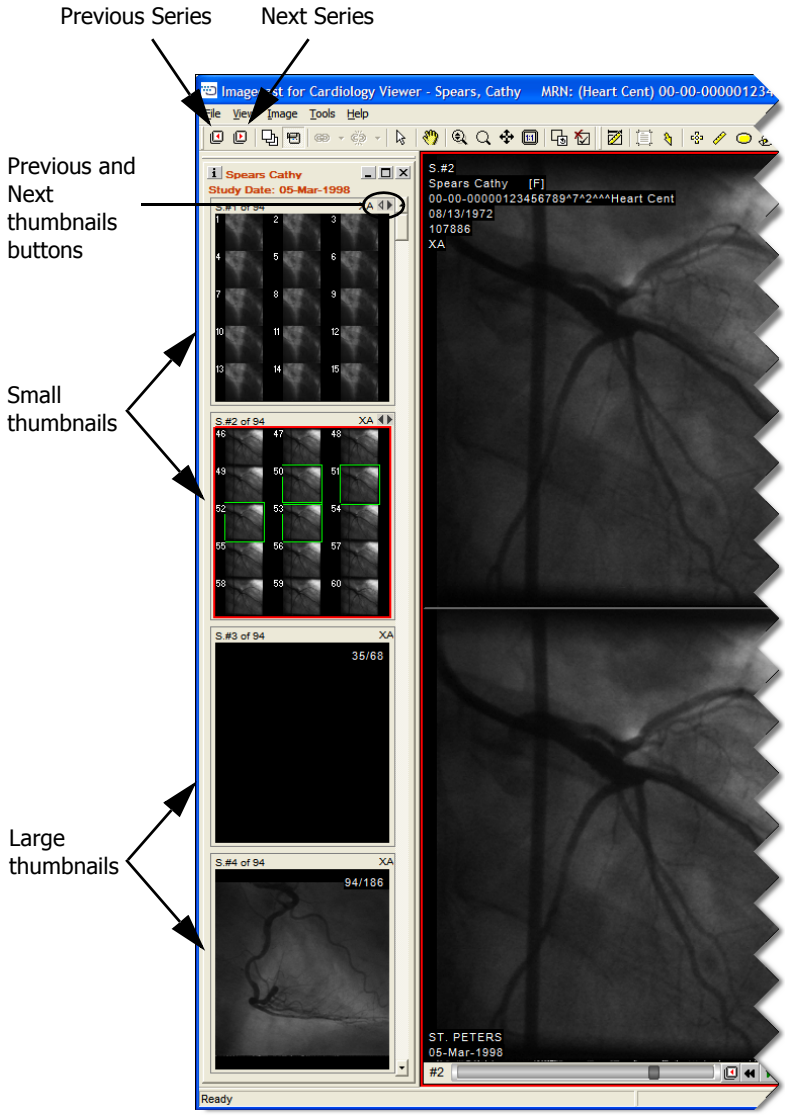
Image Navigation

The common image navigation tools are displayed below.



Series Scrolling

The Previous and Next Series buttons are located on the Image Manipulation toolbar.

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Previous Series

Click to display the previous series of the study.

Next Series

Click to display the next series of the study.

If the **Scroll Between Series** setting is enabled in the Hanging Protocol, you can automatically scroll between series using the mouse wheel.

Stack Mode

Browses through slices of a series according to the mouse movements on the image.

To Use Stack Mode

1. Click the Stack Mode button
2. Click on the image.
3. Move the mouse up and down on the image in order to browse through the series slices.

Thumbnail Scrolling

On the upper portion of the preview pane, the series number and range of series are written.

If the number of slices available is more than shown, the Previous Thumbnails Page and Next Thumbnails Page buttons are enabled.

Previous Thumbnails Page

In the image preview, displays the previous page of thumbnail slices in the series. The tooltip of the button shows the number of images in the series.

Next Thumbnails Page

In the image preview, displays the next page of thumbnail slices in the series. The tooltip of the button shows the number of images in the series.

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Thumbnail Mode

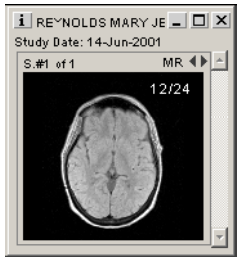
Large Thumbnails Mode

In the image preview, displays an enlarged single thumbnail of the series.

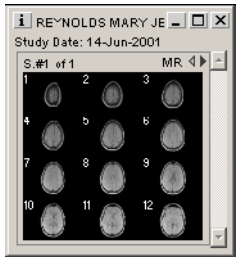
Small Thumbnails Mode

In the image preview, displays small multiple thumbnail images of the series.

Large thumbnail



Small thumbnail



Switch between small and large thumbnail mode by right clicking on the thumbnail and choosing the desired option.

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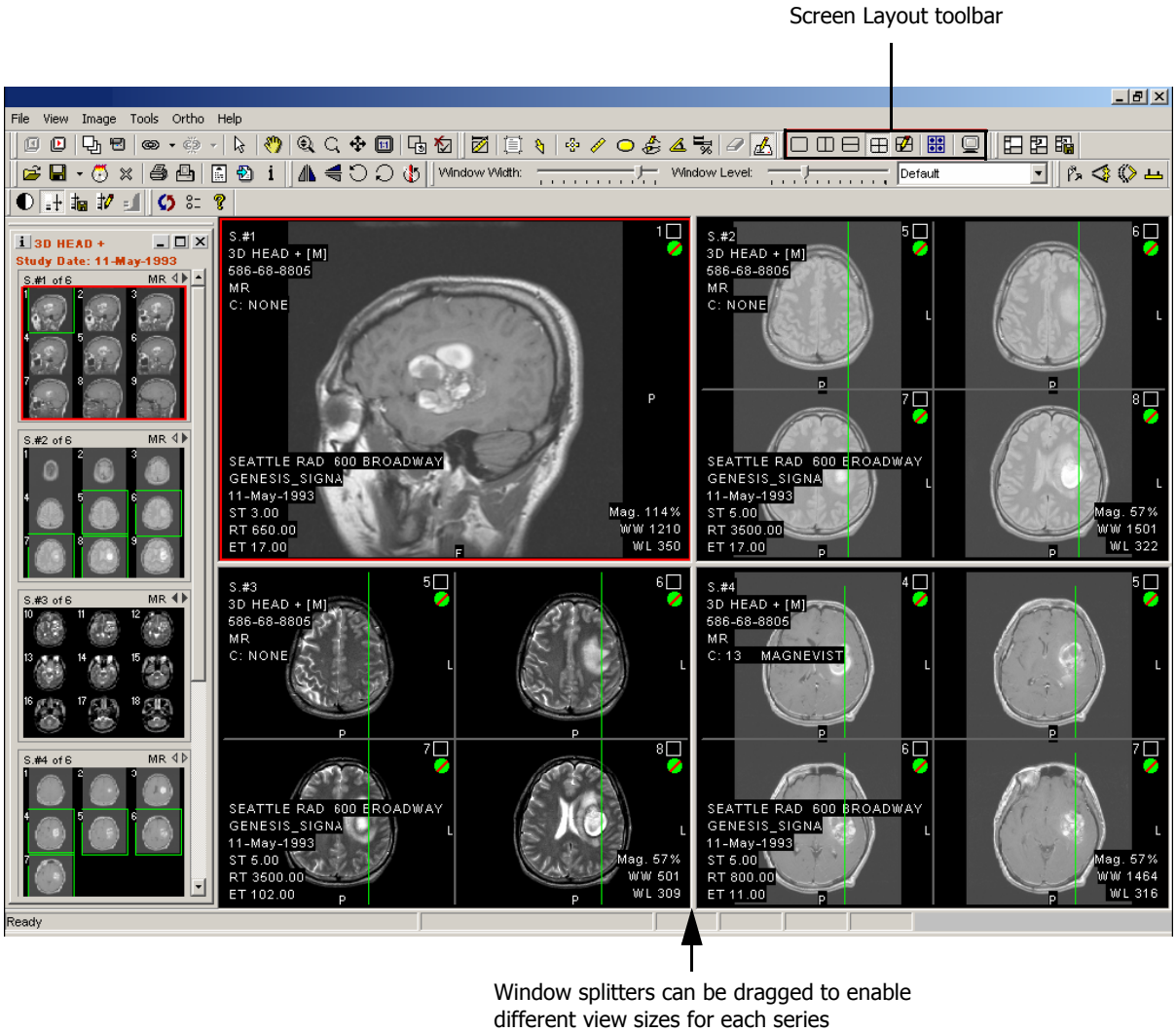
Layout

The screen layout can be changed in order to view images or series in the main view either one by one, side by side, one above another, 2x2, at a customized screen layout, or full screen.

To change the screen layout, click on the Screen Layout buttons on the toolbar . The default screen layout is set in the Settings dialog box, according to the default Hanging Protocol. For more information, refer to Hanging Protocol Settings (Optional) on page 88.

The following image shows four different series opened in screen layout 2x2:



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Predefined Screen Layouts

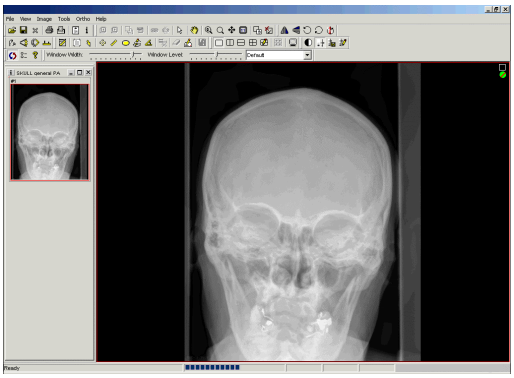
The following table shows displays the predefined screen layouts available.

Predefined Screen Layouts

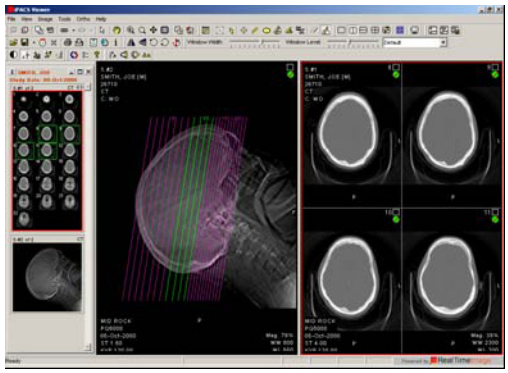
Function	Button	Description
1x1 Screen Layout		One image (or one series) is displayed in the entire main view.
1x2 Screen Layout		The main view is split vertically, allowing two images/series to be displayed side by side.
2x1 Screen Layout		The main view is split horizontally, allowing two images/ series to be displayed one above the other.
2x2 Screen Layout		The main view is split both horizontally and vertically, allowing four images/series to be displayed at the same time.

Examples of the predefined screen layouts are shown below.

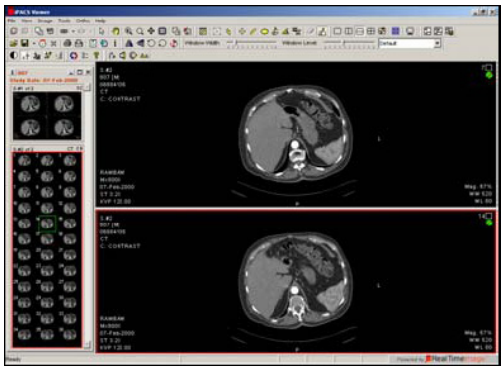
1x1 Screen Layout



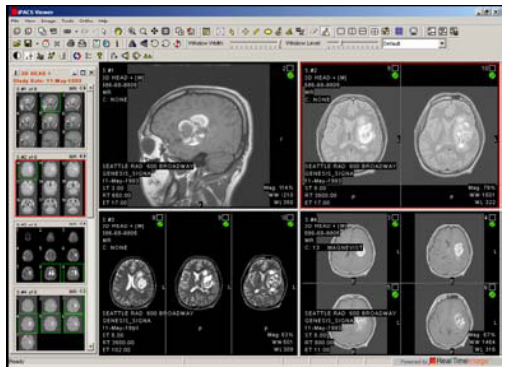
1x2 Screen Layout



2x1 Screen Layout



2x2 Screen Layout



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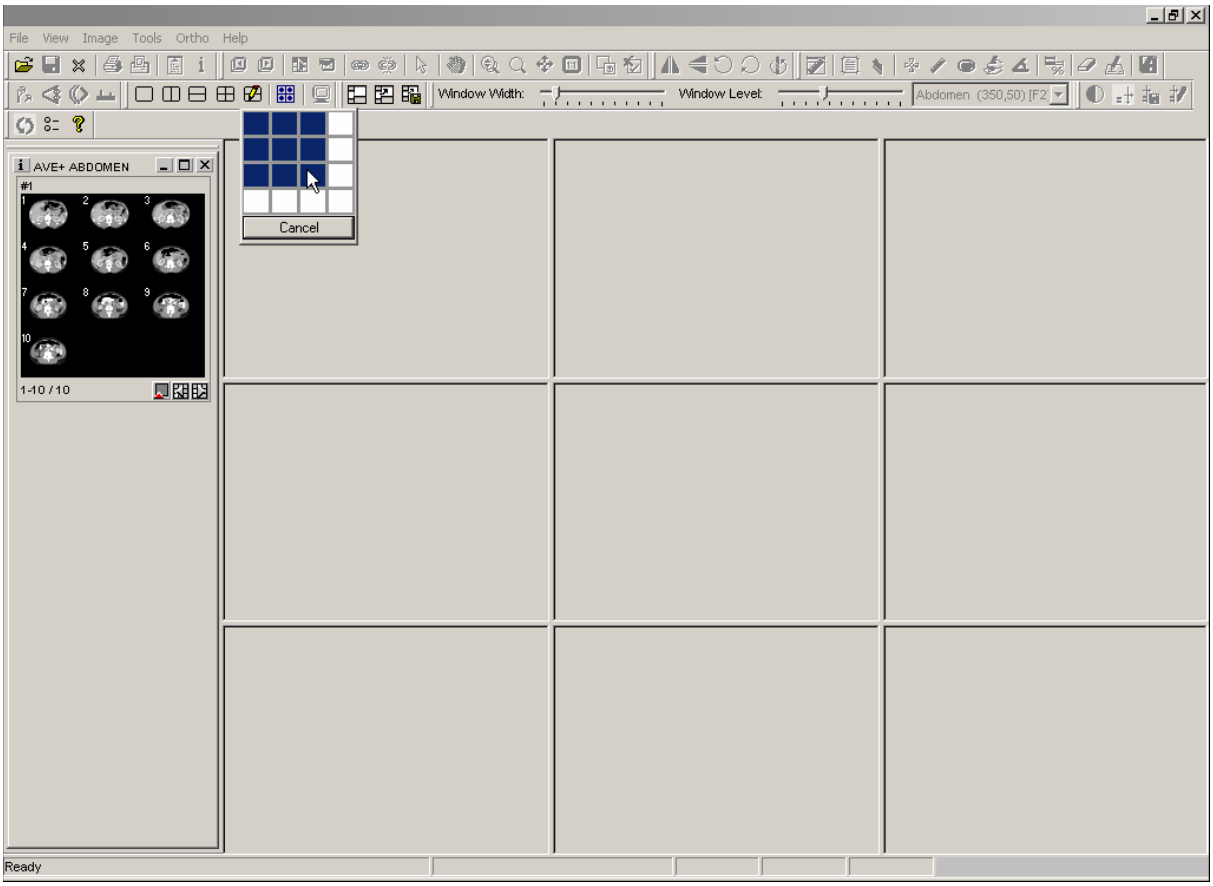
Custom Screen Layout

The main view can be split into a customized number of windows, up to 4x4.

To set a customized number of windows:

1. Click on the **Custom Screen Layout** button .
2. A 4x4 grid opens.
3. Move the mouse over the grid, until desired number of windows is selected.
4. Click the mouse and the screen layout of the main view changes.



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Series Layout

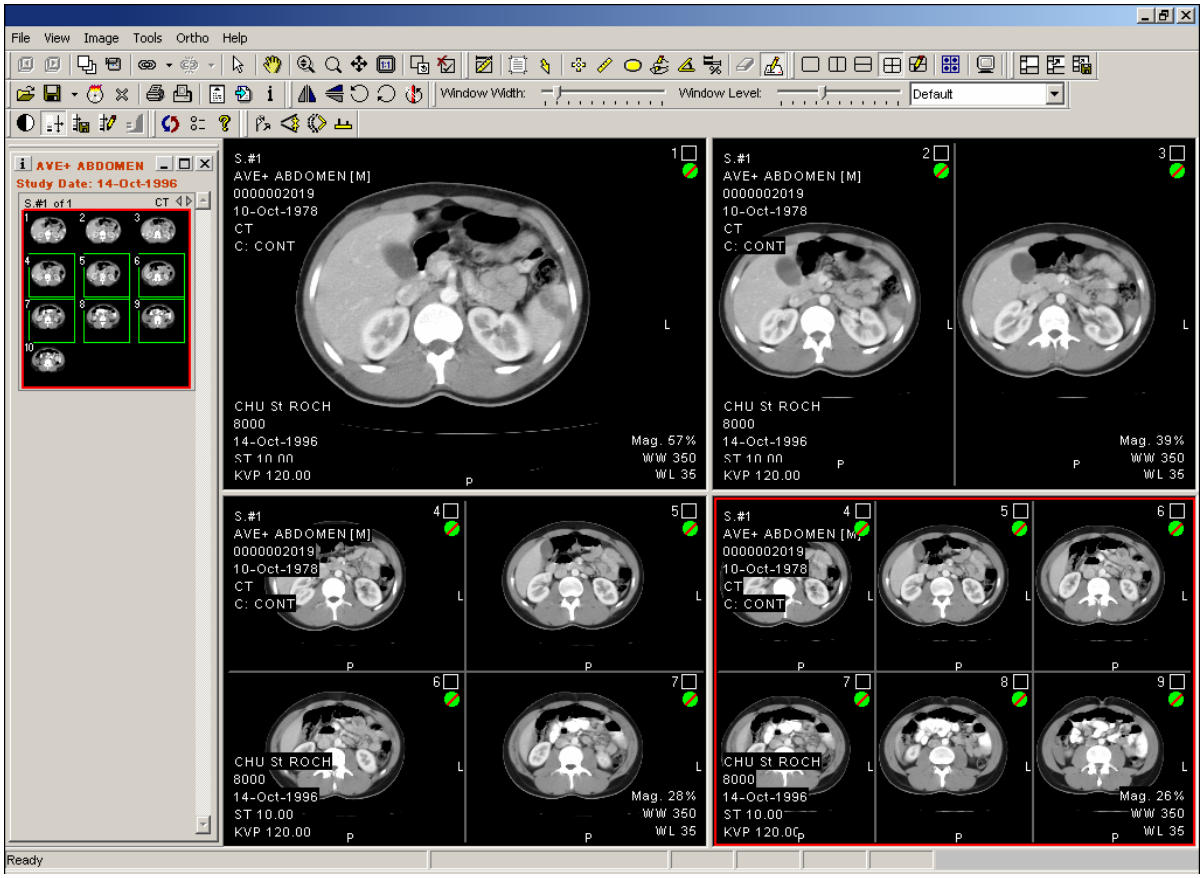
Opens up a dialog box where you can choose the layout of the displayed series slices.

Possibilities include:

- 1 x 1
- 1 x 2
- 2 x 2
- 2 x 3
- 3 x 3
- 4 x 4
- Customize

Choosing Customize opens the Custom Layout dialog box, where you can input the number of rows and columns desired in the series layout.

The following shows the same CT with different Series Layouts:



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Full Screen

The active view is enlarged in Full Screen. The image is displayed without the toolbars, using the whole screen area for maximal display.

Multi Monitor (Optional)

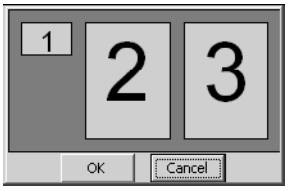
In order for the multi monitor option to be displayed, there must be more than one monitor connected, you must have multi monitor permission, and iPACS server must be installed with the appropriate license.

Default Monitors

Click on the **Default Monitors** button to open the viewer on several monitors, as defined in the default hanging protocol. The **Default Monitors** button is shown on the Screen Layout toolbar.

Select Monitors

Click on the **Select Monitors** button to open the select monitors dialog. The monitor configuration is shown below.



Click on the monitors you want the Viewer to open on temporarily.

Maximize

If the Viewer is open only on one monitor, clicking the **Maximize** button will open the iPACS Viewer full screen on that monitor only. If the Viewer is spread across several monitors, clicking on Maximize will open the iPACS Viewer full screen on those monitors.

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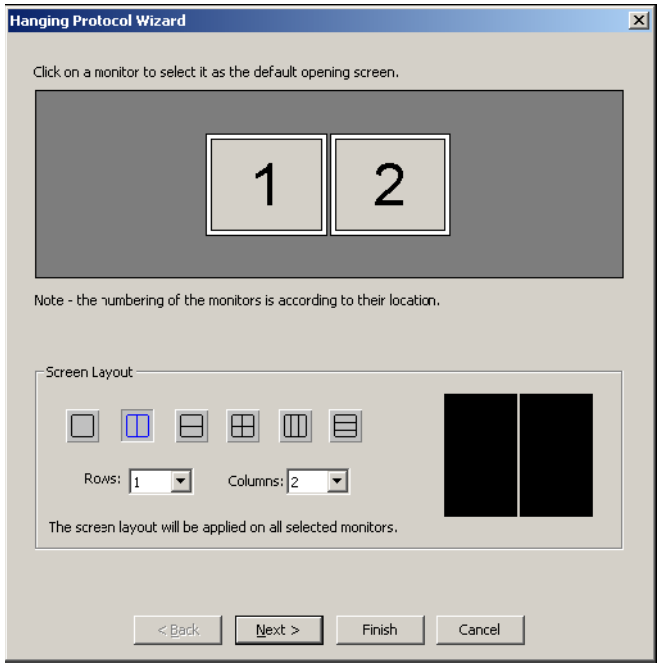
Multi Monitor in Hanging Protocol

The **Multi Monitor** configuration is automatically detected and displayed in the default Hanging Protocol.



To Use the Multi Monitor Option:

1. Open the default Hanging Protocol, and click **Next** to go to the multi monitor screen.
2. Click on a monitor to select it as the default opening screen. (The iPACS Viewer will automatically choose the left most monitor by default.)
3. To select more than one monitor, click on additional monitors. This will open the iPACS Viewer across multiple monitors.
4. Click **OK**. This setting is saved between viewer sessions.

For more details regarding how to define a Hanging Protocol, see Hanging Protocol Settings (Optional) on page 88.

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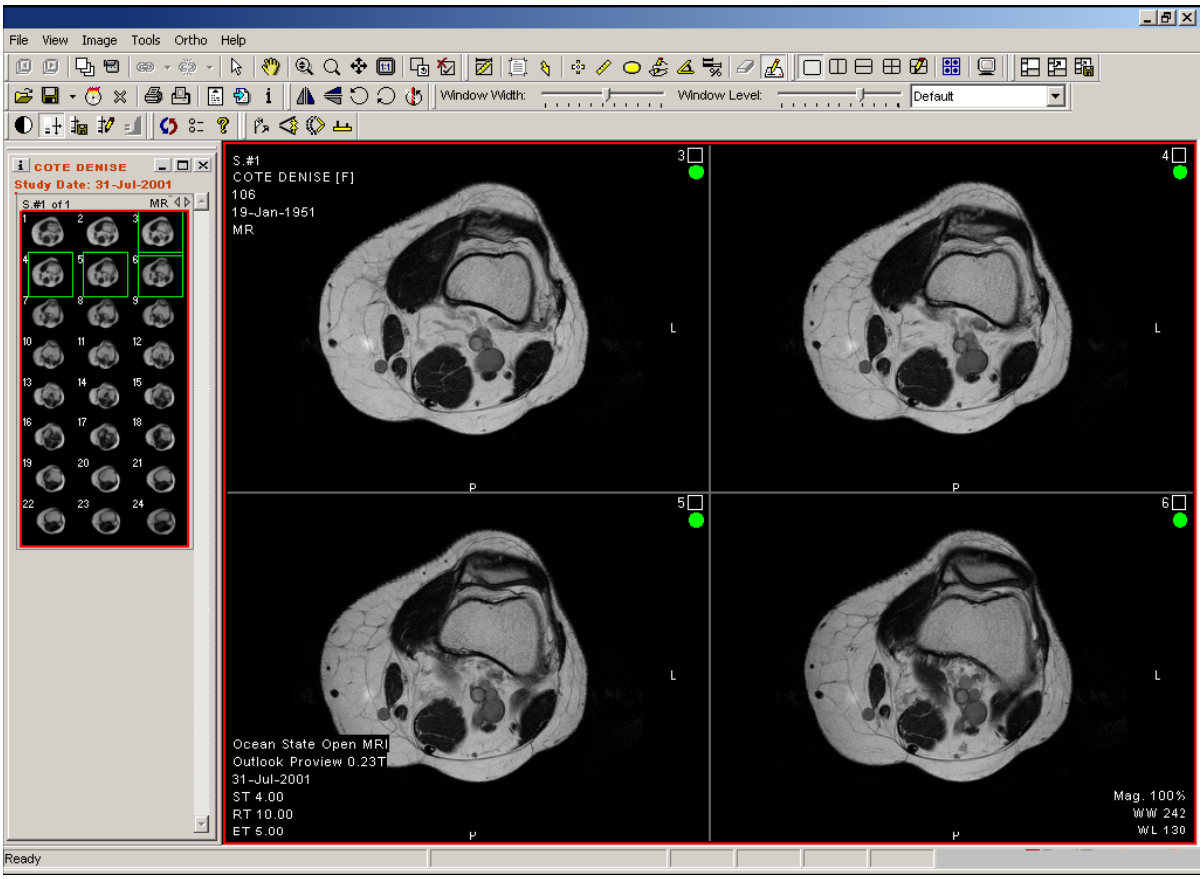
Image Quality

When an image or series is opened in the main view, a Progress Indicator appears on the status bar below the image. A Qualicator™ appears in the upper right hand corner of the image or each slice.

The image's quality continues to improve as data is streamed, until the highest possible quality is achieved.



Progress Indicator

The progress indicator shows the percentage of the image data already received from the server. A single progress indicator is displayed in the status bar below the main view for all displayed images in a series. The progress indicator disappears once all data has been received.

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Qualicator

The Qualicator™ appears on the upper right-hand corner of each image/slice in the main view. It indicates the level of quality of the image during streaming, as compared to the original image.

Qualicator™ States

Symbol	Name	Description
	Lossy	During streaming, until Lossless View quality is achieved, the quality is Lossy. Visually lossless is achieved well before Lossless View. However, since there is no mathematical definition of Visually lossless, iPACS Qualicator™ stays Lossy
	Lossless view	In 1:1 resolution, all data has been received for the current Region of Interest at the current (8 bits) display of the image, taking into account the current Window Width.
	Lossless	In 1:1 resolution, all the data for the current region of interest has been received. Each pixel is exactly identical to the same pixel in the original image.
	All data received	For resolution different than 1:1, all the data for the current view has been received. 'Lossless' state cannot be defined, because original image in this scale doesn't exist. This indicator will also be displayed if the original image received by the iPACS Server is lossy (for example, lossy jpeg) or the aspect ratio is not 1:1 and interpolation must be performed.

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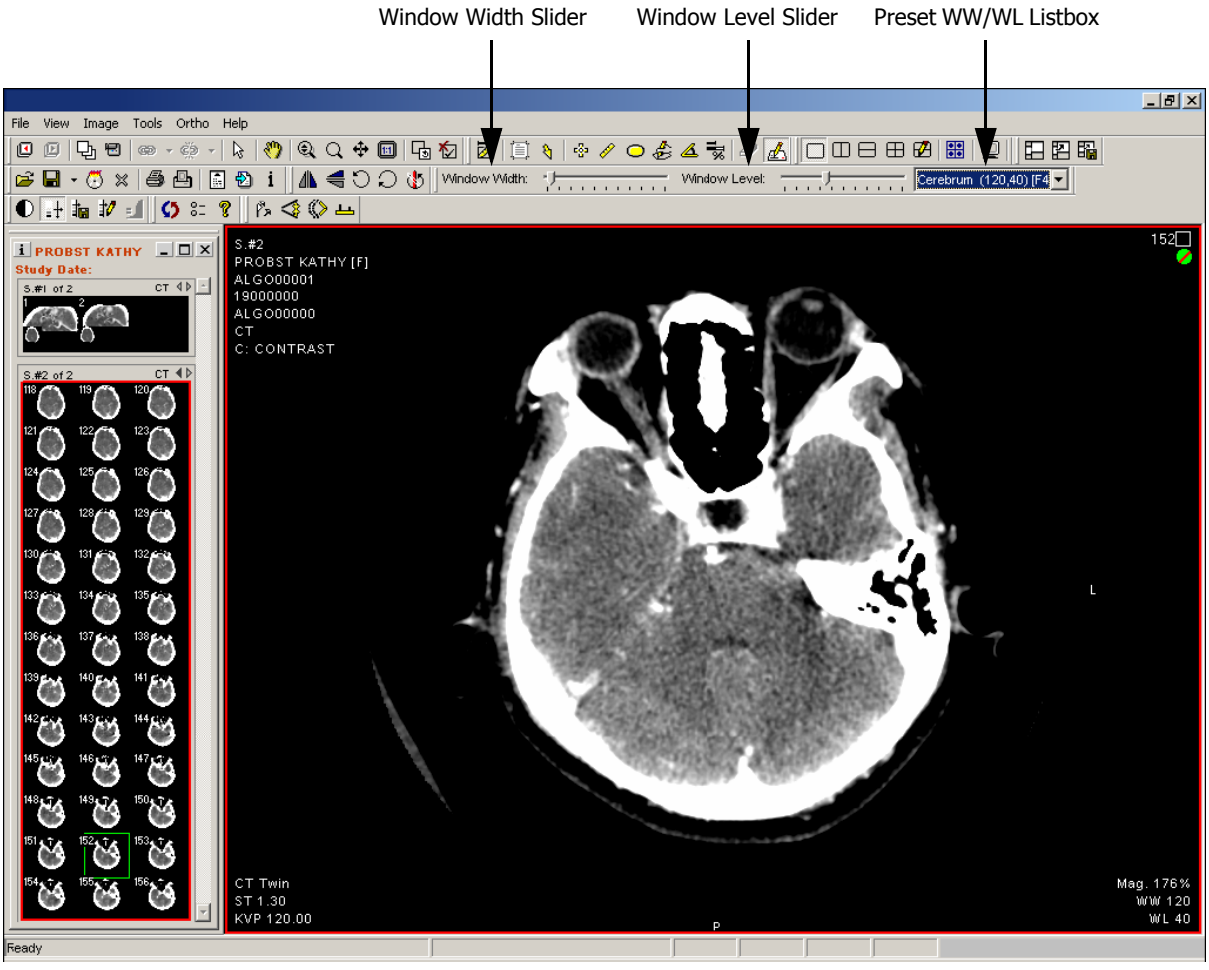
Window Width and Level

The Window Width (WW) and Window Level (WL) allow you to control the range of gray levels to be displayed on the 8-bit monitor from 12—16 bit images.

Adjusting the window width and level can be done in following ways:

- Use the WW and WL Sliders located on the toolbar.
- Use the Windowing button on the toolbar, or from the pop up menu, to change the cursor to the Windowing tool . By dragging your mouse horizontally and vertically, you can change the WW and WL respectively.
- Use the Modality Preset Window Settings for images to emphasize different tissues.

The following study uses the Modality Preset CT Window Settings for Cerebrum:



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The same study using the modality preset CT window settings for bone:

Window Width (WW) Slider

To change the Window Width (WW) value, move the slider to the right of the WW back or forth. Change takes effect immediately.

Window Level (WL) Slider

To change the Window Width (WL) value, move the slider to the right of the WL back or forth. Change takes effect immediately.

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Preset WW/WL Listbox

Displays a list of preset WW/WL values. The preset WW/WL values are changed according to the modality of the image in the active view. These values are defined in the Modality Presets, which are found in the Settings dialog box.

By default, preset values are defined for the CT modality. Other modalities have no predefined values. New preset window values can be defined in the Settings dialog box or from the pop up menu (**Window** > **Save Current**).

If an image has a Look Up Table (LUT) defined for it in the DICOM Header, LUT is listed in the Preset listbox. The image will be displayed using the predefined LUT.

Invert Color

Inverts the gray levels of the image. (Black is displayed as white and vice versa.) Clicking the button again returns the image to its original state.

Windowing Button

To change the WW and WL, click on the left mouse button and drag the cursor across the image. Cursor changes to windowing tool .

Pressing the mouse wheel and moving it on the image will also perform WW/WL changes.

To Change the Window Width

Click on the left mouse button and drag the mouse vertically. The change is reflected in the WW sliders on the Windowing toolbar and in the Overlay Annotations (bottom right hand corner.)

To Change the Window Level

Click on the left mouse button and drag the mouse horizontally. The change is reflected in the WL slider on the Windowing toolbar and in the Overlay Annotations (bottom right hand corner.)

Save Current Preset

To Save the Current Window Width and Level as a Modality Preset:

1. Click on Save Current Preset button or click on right mouse button to access the pop up menu and select Window -> Save Current.

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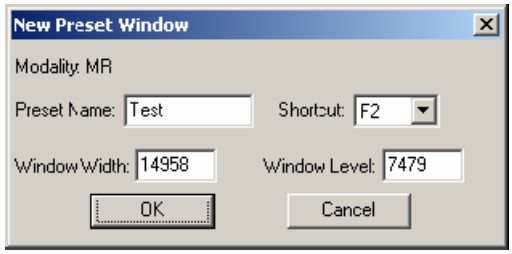
2. The New Preset Window opens.

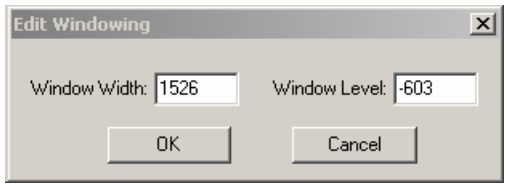


3. The New Preset is defined for that Modality with the currently displayed windowing.
4. Define a name for the preset and shortcut if desired.

Edit Windowing

To Enter the Window Width (WW) and Window Length (WL) Values Manually

1. Click on the Edit Windowing button .
2. The Edit windowing dialog box opens.



3. Enter values in the **Window Width** and **Window Level** fields.
4. Click **OK** to implement your changes.

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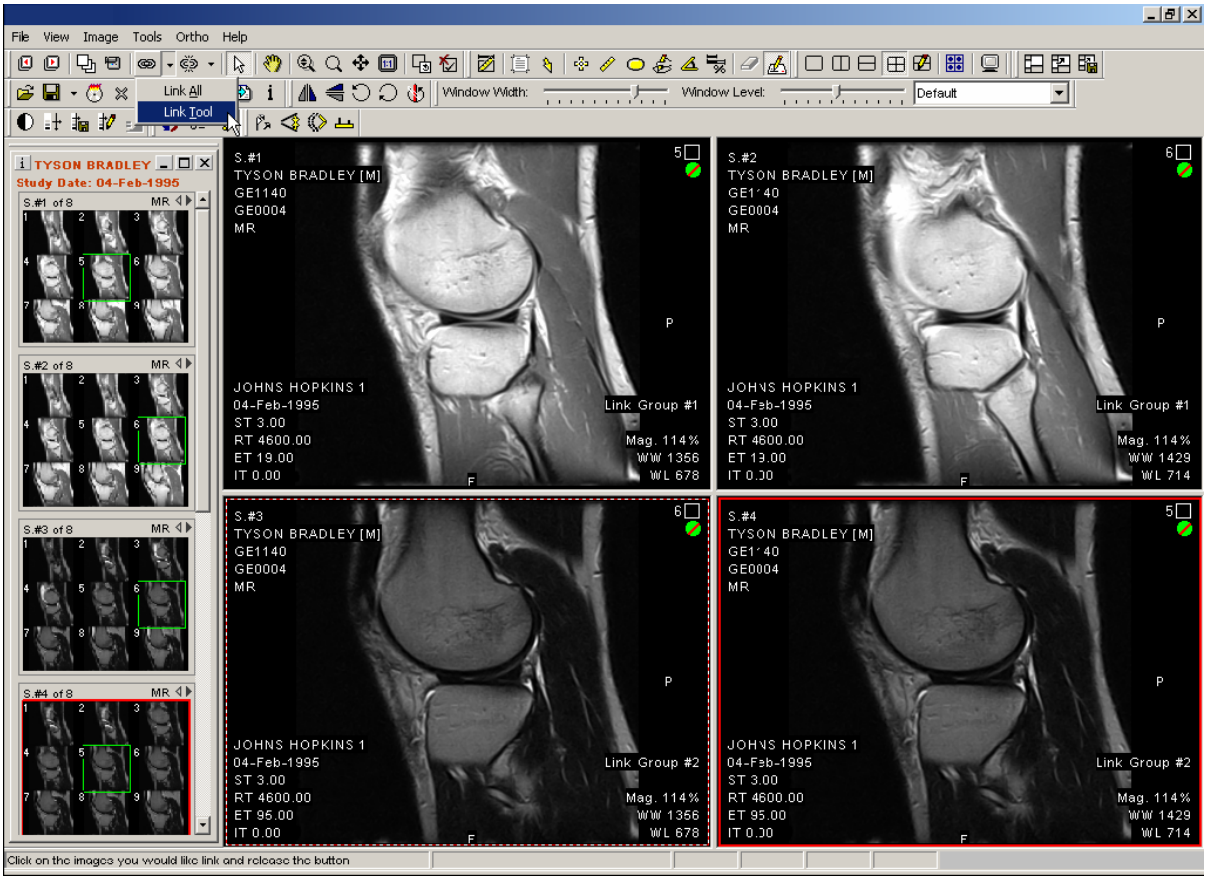
Image Manipulation

Link Tool

When viewing several studies or series, you can link images/series together in order to perform actions simultaneously. When two or more images/series are linked, image manipulation and orientation changes are concurrently performed on all connected images/series.



To Link Series Together:

1. Click the arrow next to the **Link** button .

You can select **Link All** or **Link Tool**.

- **Link All** connects all series opened in the main view.
- **Link Tool** allows you to decide which series to link.

2. Select **Link Tool**.
3. The cursor changes to the link cursor .

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4. Click on each of the series that you want to link together.
5. All series linked together will have the words *Link Group #* added to the lower right hand corner of the image.
6. Press **ESC** to exit from Link mode.

To Add a Series to an Existing Link Group:

1. Click on the arrow next to the **Link** button .
2. Select **Link Tool**.
3. Click on one of the images in the Link Group that you want to connect to.
4. Click on the new image that you want to add to the group.
5. The words Link Group # added to the lower right hand corner of the new image.
6. Press **ESC** to exit from Link mode.

Unlink Tool

Click on the **Unlink** button to unlink connected series.

To unlink a linked series:

1. Click on the arrow next to the Unlink button on the toolbar.
2. Select one of the following:
   - **Unlink All** unlinks all connected series.
   - **Unlink Active Group** unlinks only series of the selected group (if more than one linked group exists.)

Select Tool

Changes the cursor to the select tool.

Pan Tool

Panning can be used to move the ROI (Region of Interest) on the preview pane or on the main view.

To Move to a Different Part of an Image Without Changing Magnification

1. Click the **Pan** button .
2. Cursor changes to Hand Tool .
3. Click and drag the image or the ROI to the desired location.

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Zoom Tool

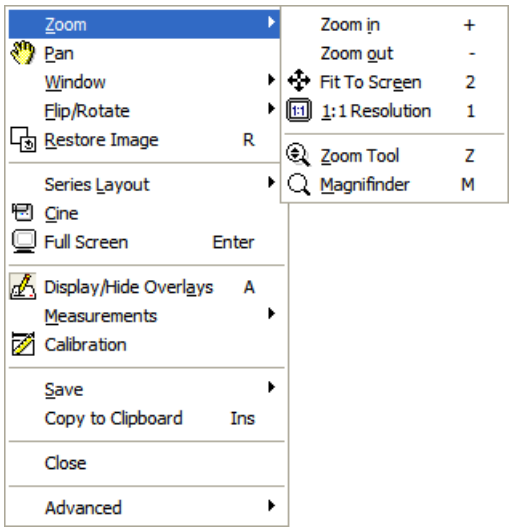
Continuously increases and decreases the magnification level according to the mouse movements on the image.

To Use the Zoom Tool

1. Click on the **Zoom** button or right-click on the image and select the **Zoom** > **Zoom Tool** from the pop-up menu.
2. Click on the image to be zoomed.
3. Do one of the following:
   – Move the mouse up the image to increase the magnification.
   – Move the mouse down the image, to decrease the magnification.

- The zoom level of the image can be increased, up to 6400% magnification level.
- The image is centered on the clicking location.

To increase the zoom level once, by a factor of two, while retaining the previous cursor, right-click the image and select **Zoom** > **Zoom In** from the pop-up menu. To decrease the zoom level once, by a factor of two, right-click the image and select **Zoom** > **Zoom Out** from the pop-up menu.



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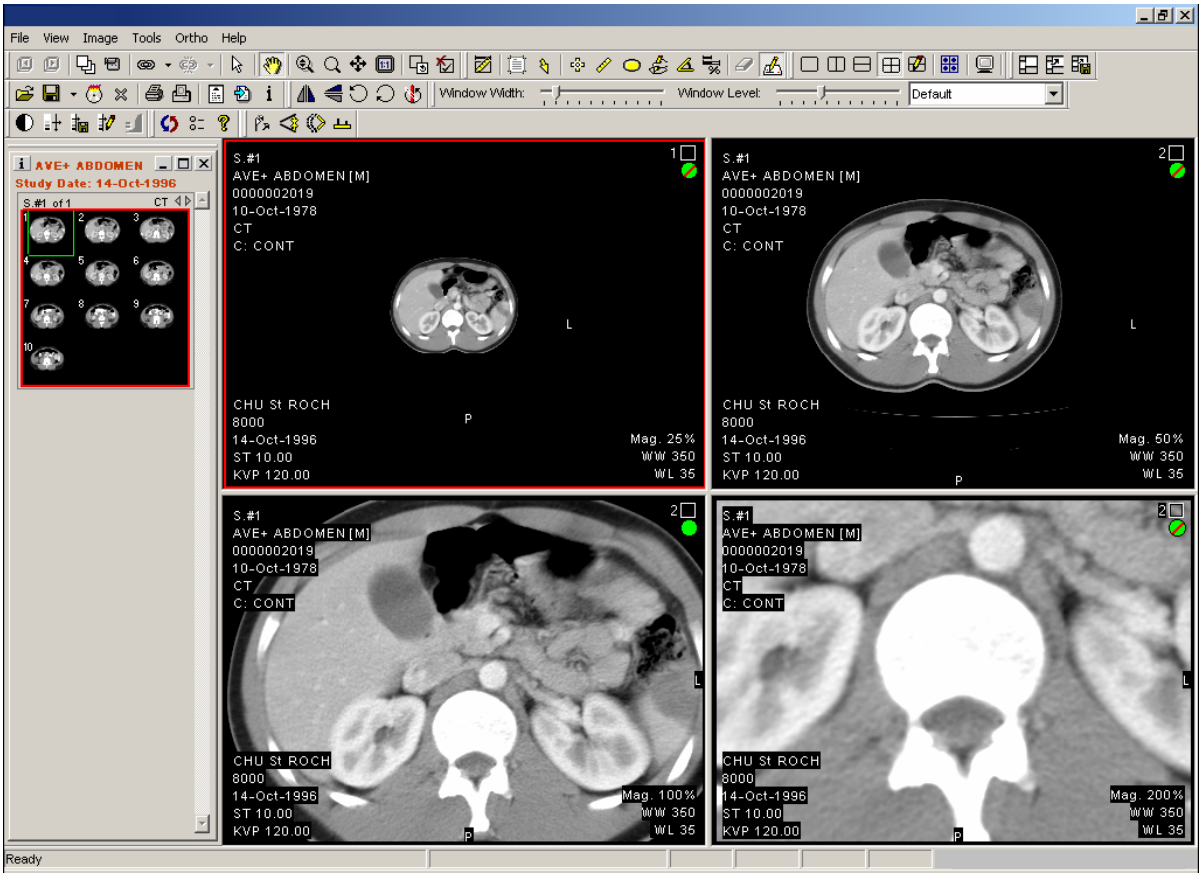
The following screen shot shows the same CT slice at different Zoom levels:



Magnifinder

Clicking the **Magnifinder** button changes the cursor to a magnifying glass. When you click on the image, the area is magnified in a magnification square. Cursor changes to the four-way cursor.

You can drag the Magnifinder™ on the image. When you stop dragging, the Magnifinder™ is updated from the server, up to lossless or all-data-received quality.

A Qualicator™ is displayed on the Magnifinder™ square to display its instantaneous quality.

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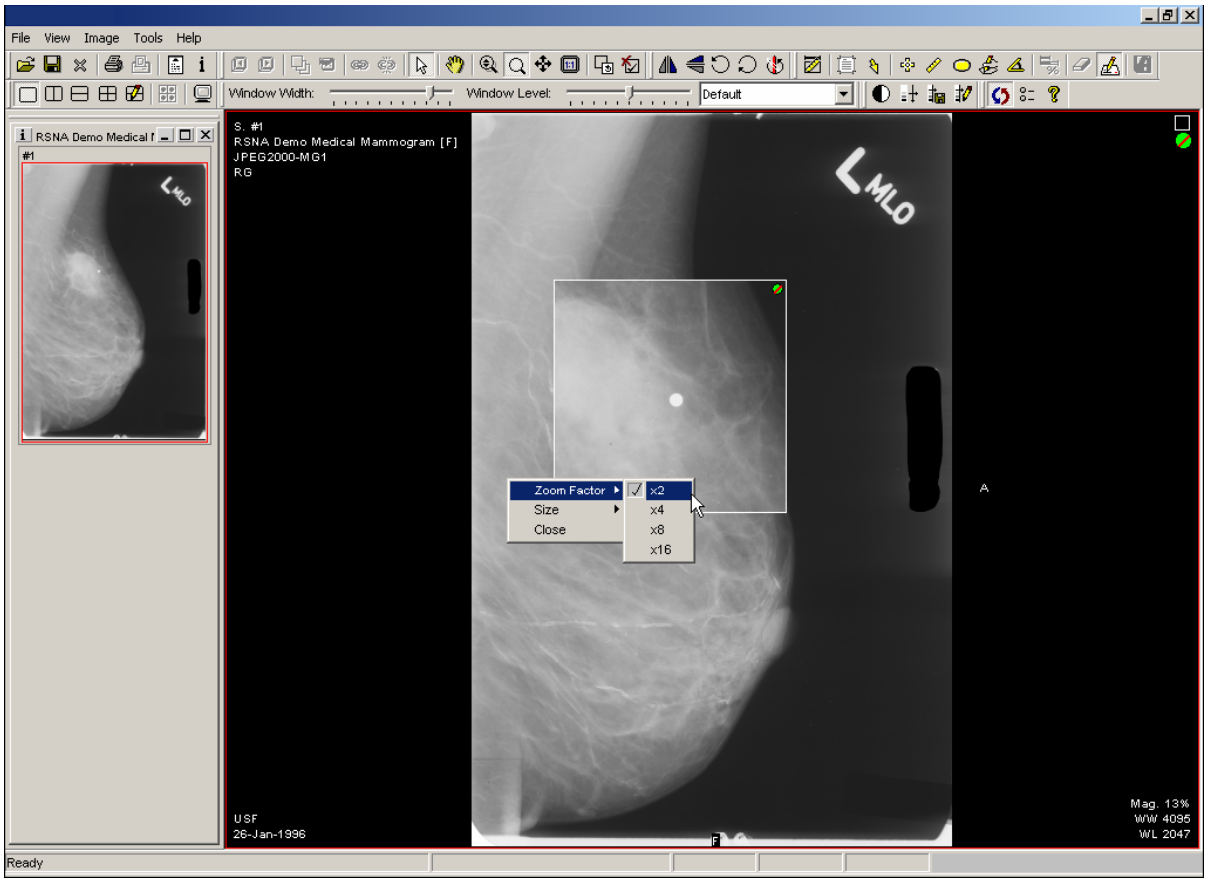
The size and magnification factor of the Magnifinder™ are set when clicking on the right mouse button. A secondary pop-up menu is opened. This menu appears only when the Magnifinder™ tool is activated.



The settings for the Magnifinder™ are:

- Zoom factor:
  - x 2
  - x 4
  - x 8
  - x 16
- Size:
  - Small
  - Medium
  - Large
- Close

The Magnifinder defaults are set in the Settings dialog box.

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Clicking again the **Magnifinder** button removes the Magnifinder™ from the main view. You can also close the Magnifinder™ by unselecting it in the pop-up menu. Click on the right mouse button in the main view, outside of the Magnifinder™ area, in order to access the pop-up menu.

Fit To Screen

Zooms in on image to greatest possible magnification for the current screen layout, so that the image fits to the part of the screen it appears in.

1:1 Resolution

Sets the image to 1:1 resolution. Every pixel displayed corresponds to a pixel of the original image.

Only at this resolution is lossless quality achieved, in other resolutions all available data is streamed.

Restore Image

Returns the active image to its original position, zoom, orientation, and window.

Unselect All Images

Clears all images that were selected for DICOM printing or save.

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Cine (non-cardio)

When viewing a large number of slices from a CT or MR, it is often helpful to view them in as an automatic cine loop. Viewing in Cine loop helps give an overview of the entire body part.

Cine Button

When clicking on the **Cine** button in the toolbar, cine starts in the main view. (Cine is disabled for single images.) Image quality is improved as more cine loops are played.

Cine is run in scale and quality according to the settings from the Cine Settings button. Default values are according to those set in the Settings dialog box. For more information, refer to Cine (non-Cardio) Settings on page 97.

To change the general cine settings, click on the Settings Button located on the toolbar. Select the Cine tab from the Settings dialog box.

Cine Image Toolbar

Play/Stop

Play/Stop the cine.

Play the cine—according to the required playback order as set in the settings tab. Cine starts from the first displayed slice of the active series.

Stop the cine. When resuming play, the cine continues from the paused slice location.

Show/Hide Speed Bar

Opens and closes the Cine Speed Slider window.

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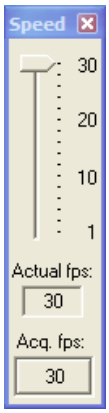
Cine Speed Slider Window



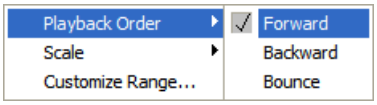
To change the speed of the cine, move the slider back or forth. Default speed is according to your preferences. Maximum speed is 30 frames per second.

The actual number of frames per second is displayed at the bottom of the window. Actual fps is limited by computer memory and current resources.

Acquisition rate or default frames per second is displayed in the lower part of the window.

Current Cine Settings Button

Opens a menu where you can choose the settings for the cine currently running.



- Playback Order
  - Forward (First to Last, First to Last …) (Default)
  - Backward (Last to First, Last to First,…)
  - Bounce (First to Last, Last to First, First to Last,…)
- Scale
  - Fit To Screen (Default)
  - 2:1
  - 1:1
  - 1:2
  - 1:4
  - 1:8

If a scale is not available in the current window, it is grayed out.

- Customize Range...Opens the Customize Cine Range dialog box.

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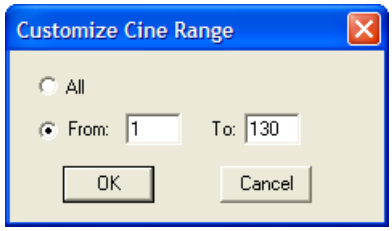
Customize Cine Range (From / To)



To run the cine from a specific slice location to another, enter slice numbers in the From/To input boxes. The default shows the whole series, from the first to the last slice.

When entering a new value in From or To, the cine is stopped. It is run again with the new settings after you click **OK**.

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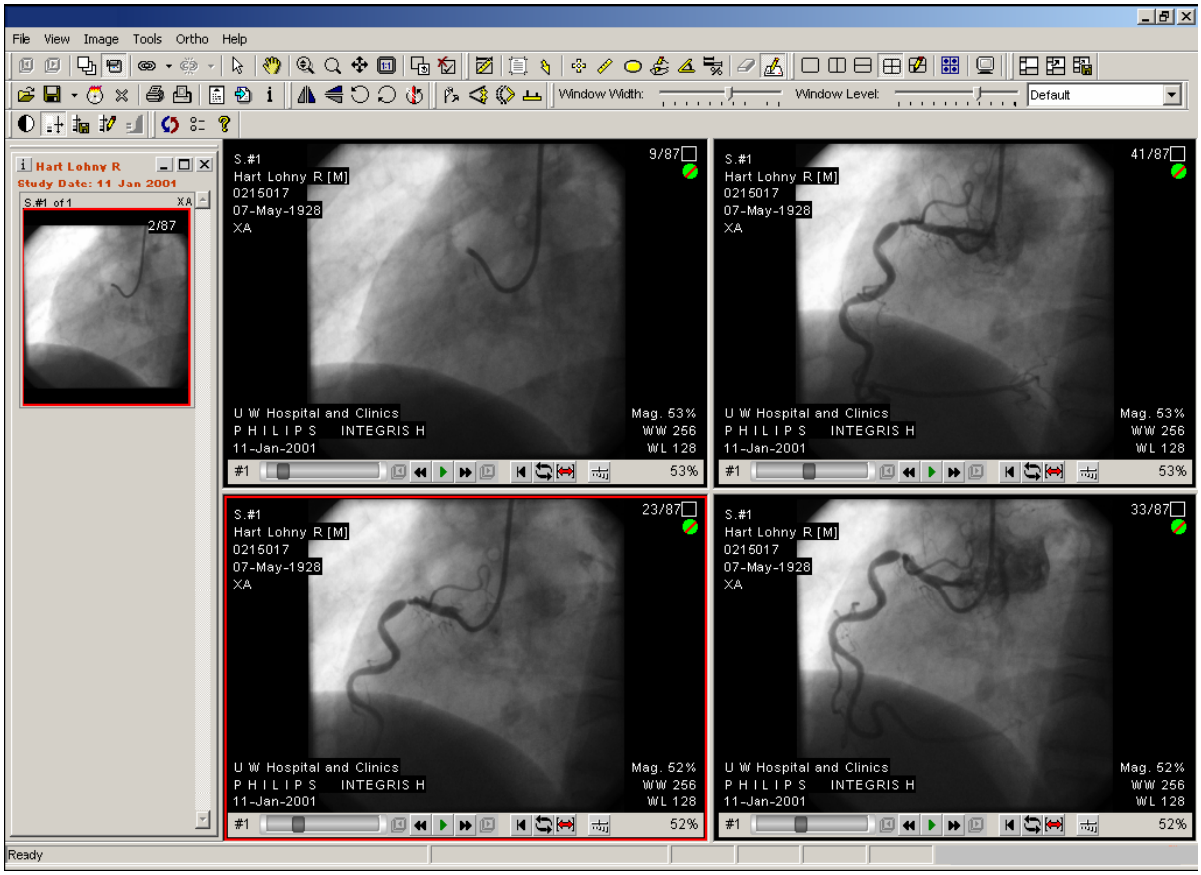
Cardiology Cine (Optional)

The Cardiology Viewer provides all viewing functions in Cine mode. You can run Cine on several series or studies at the same time. When opening a study in the Cardiology Viewer, if it has a defined acquisition rate, it is automatically run in Cine mode.



During Cine, you can manipulate the image as needed, including:

- Zoom
- Windowing
- Invert Color
- Fit To Screen
- 1:1 Resolution
- Pan
- Show/Hide Overlays
- Change Orientation

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To change windowing using the mouse, press on the middle mouse wheel and drag across the image. To use measurement tools, you must stop the cine.

A multiframe study, which has no acquisition rate defined for it in the DICOM header, will not start cine automatically.

Cardiology Cine Toolbar

The Cardiology Cine toolbar includes the following functionality:

Cardiology Cine Toolbar

Name	Button	Description
Cine Toolbar		
Series Number		Indicates which series is being displayed.
Cine Slider		The slider shows the position of the current slice being displayed in cine. The tool tip of the slider shows the exact slice number in the series. The slider also serves as a progress indicator. The background bar shows the progress of received data.
Previous Cine		Changes the series displayed in the main view to previously run cine.
Next Cine		Changes the series displayed in the main view to next cine to be run.
Step Backward		Moves the cine back by predefined number of slices, as set in the **Settings** > **Cine** tab.
Step Forward		Moves the cine forward by predefined number of slices, as set in the **Settings** > **Cine** tab.
Play/Stop		Plays the cine or stops the cine.
Go to First Image		Jumps to the first image of the cine loop.
Switch Playback Order		Switches from forward to backward or from backward to forward.
Cine Range		Run the cine from a specific slice location to another.
Show/Hide Speed Bar		Opens or closes the cine speed bar.
Actual Speed		Displays actual speed of cine in frames per second (fps).
Magnification		Displays the magnification that the image is currently shown.

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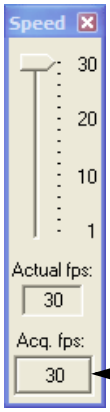
Speed Bar

Open/close the speed bar by clicking on Show/Hide Speed Bar on the Cine Top bar.



Change to Acquisition Rate button

When cine is run, the speed bar allows you to control the viewing rate.

The default speed, in which cine is run, is the acquisition rate from the DICOM file. If there is no acquisition rate in the DICOM file, the cine is run in the default rate as defined in your settings.

The acquisition rate is shown at the bottom of the floater (Acq. fps.) You can change the actual frames per second using the slider. You can return to the acquisition rate by pressing on the Change to Acquisition Rate button 12.

Link Cine Loops

When linking cine loops, any action using regular tools will be applied to all linked cine loops. This includes tools from any one of the cine top bars, such as Play, Pause, etc. For example, if you click on Pause, all cine loops will be paused. If you zoom on one of the loops, all loops will be zoomed.

When two cine loops are linked, they might not have the same exact series length. You can define if you want to stop when the shortest cine has finished or to wait if until the longer cine has completed. This is determined by you in the **Settings** > **Cine** tab.

Select Synchronize Linked Cine:

- Long Run (restart when longest run is finished)
- Short Run (restart when shortest run is finished)

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You can have more than one linked cine group.

WW/WL will be applied separately to each cine loop, even if they are linked.

To Link All Cine Loops Together

1. Click the arrow next to the **Link** button .
2. Select **Link All**.
3. The cine loops will now play together, synchronizing according to your settings.
4. Press **ESC** to exit from Link mode.

To Link Certain Cine Loops to One Another

1. Click the arrow next to the **Link** button .
2. Select **Link Tool**.
3. The cursor changes to the link cursor .
4. Click on each of the cine loops that you want to link together.
5. All series linked together will have the words *Link Group #* added to the lower right hand corner of the image.
6. Press **ESC** to exit from Link mode.
7. Those cine loops will now play together, synchronizing according to your settings.

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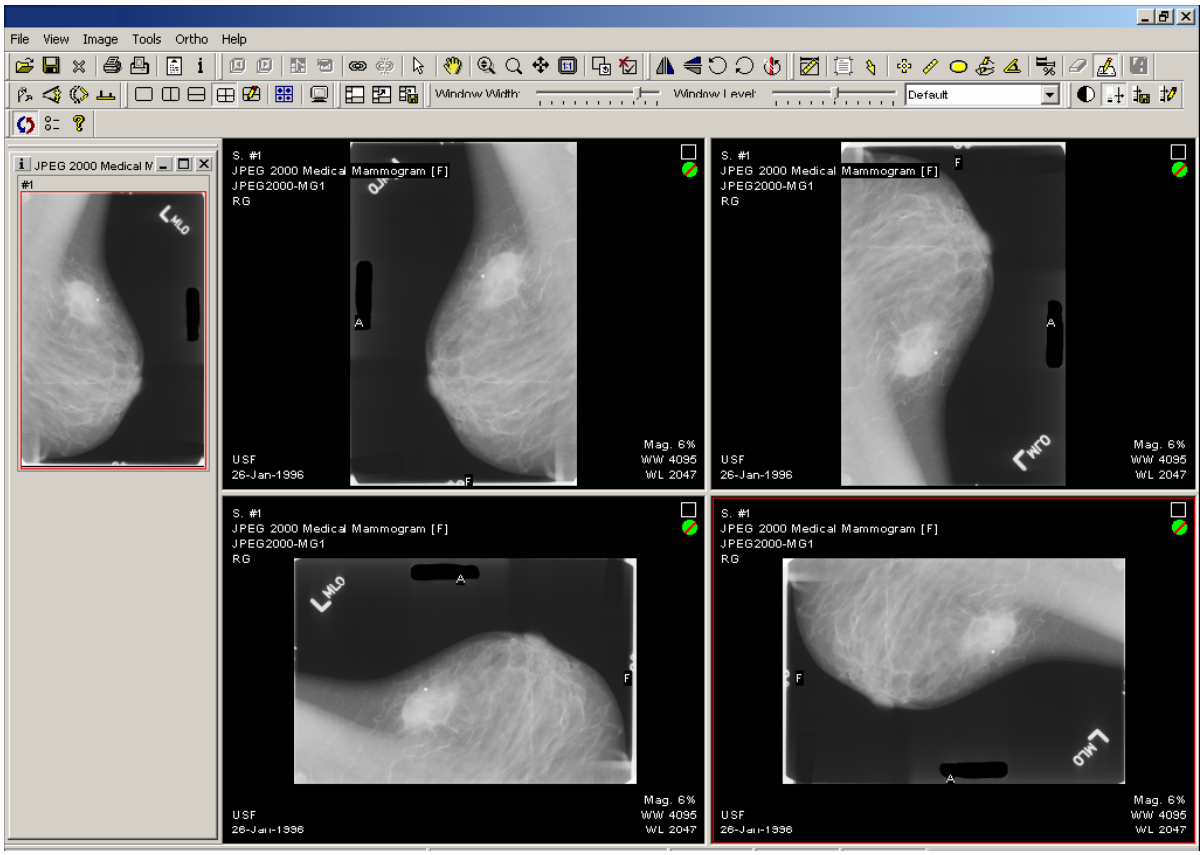
Image Orientation

The Image Orientation toolbar has the following tools.

Image Orientation Tools

Name	Button	Description
Image Orientation toolbar		
Flip Horizontal		Flips the image horizontally, along the vertical axis.
Flip Vertical		Flips the image vertically, along the horizontal axis.
Rotate Left		Rotates the image 90° to the left.
Rotate Right		Rotates the image 90° to the right.
Reset Orientation		Resets the image to its initial orientation.

An example of the tools effects are shown below.



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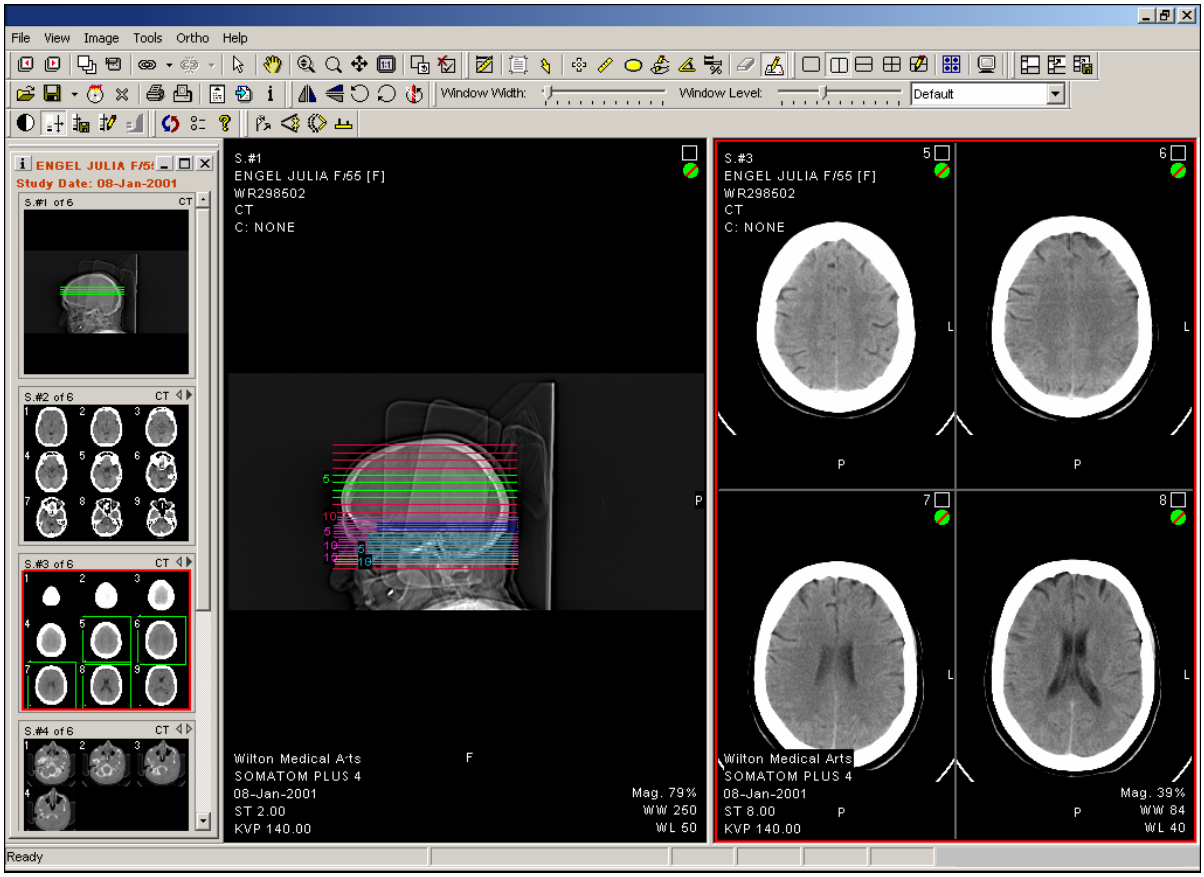
Slice Positioning

Using a Localizer (Scout)

If a CT study includes a localizer, the Viewer will display it in the preview pane according to its series number. When a series is selected, the slice indicators appear on the preview pane of the localizer as green lines. As you scroll through the slices in the main view, the change in position is indicated in the localizer. This allows for easy location of slice position.



If you select the localizer image for display in the main view, slice indicators of the study are displayed on the localizer image. Slice indicators of the active series are shown in green.

You can set in the Settings dialog box, whether to display all slice indicators of all series or only of the active series.

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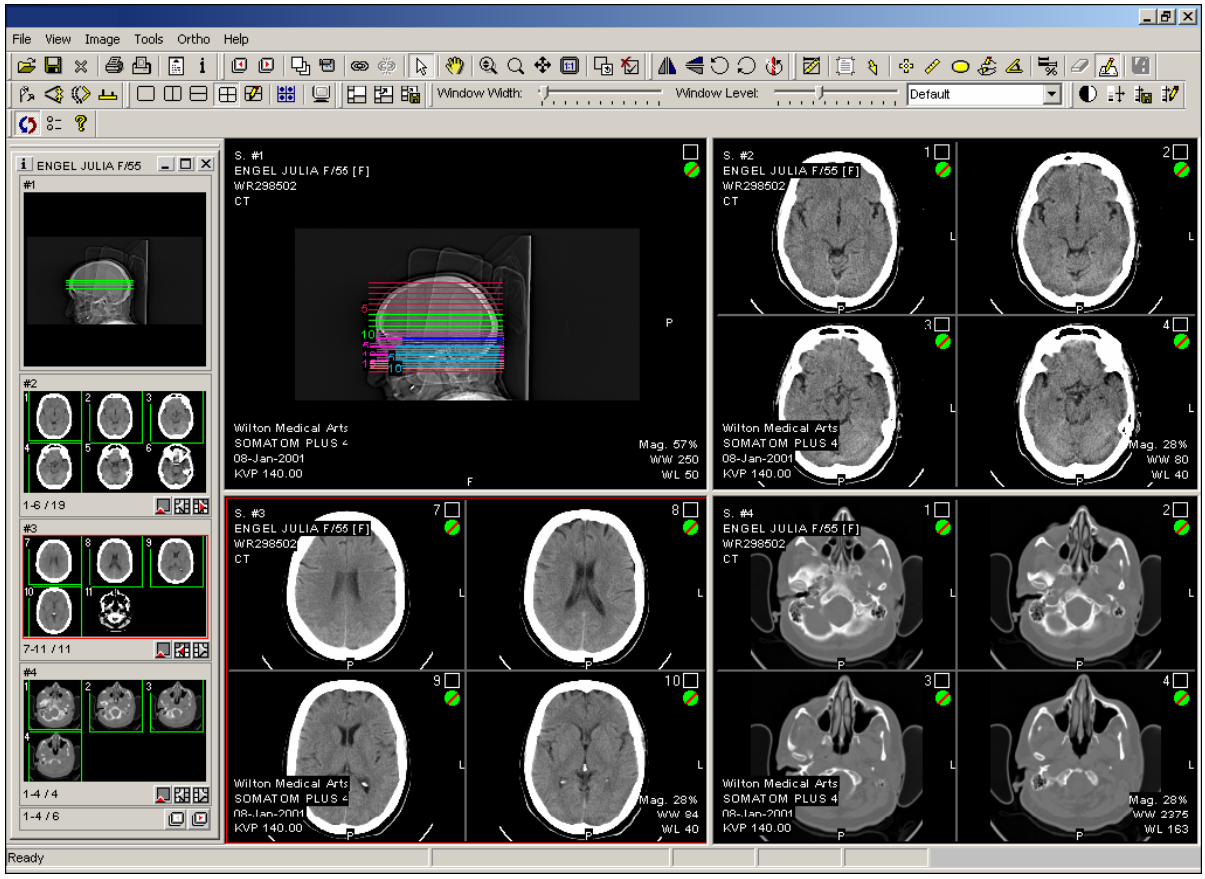
Each series of the study is designated with a different color for easy reference. If a particular series is active after the localizer is opened in main view, the slice indicators of that series change to green.



The space between the slice indicators on the localizer is proportional to the difference in the original image position of the different series as indicated in the DICOM header.

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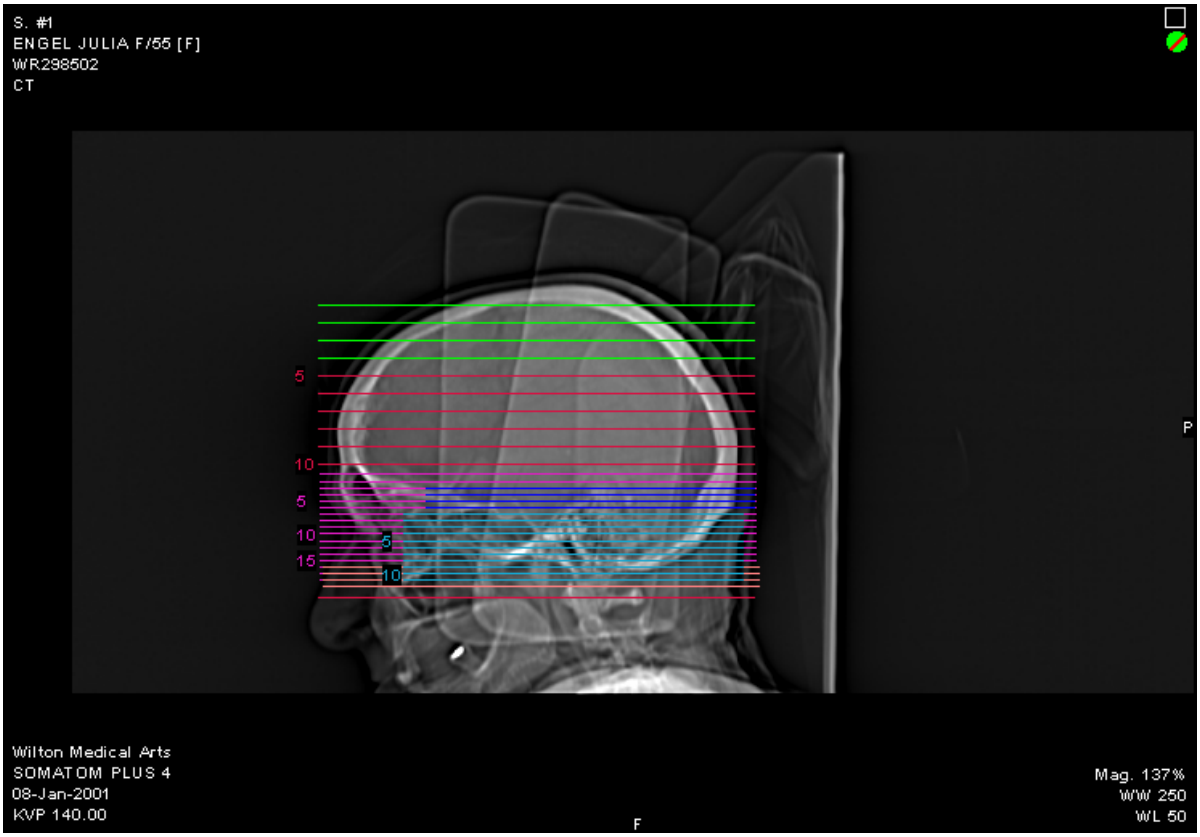

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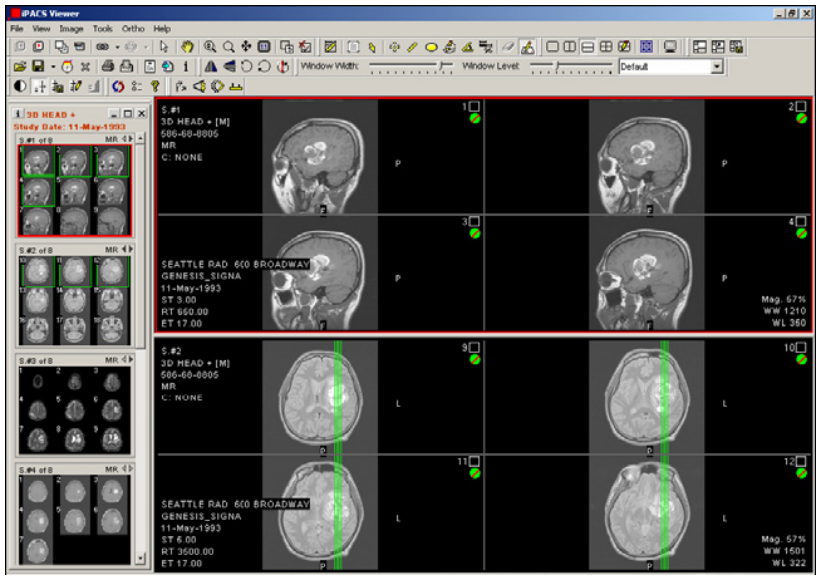
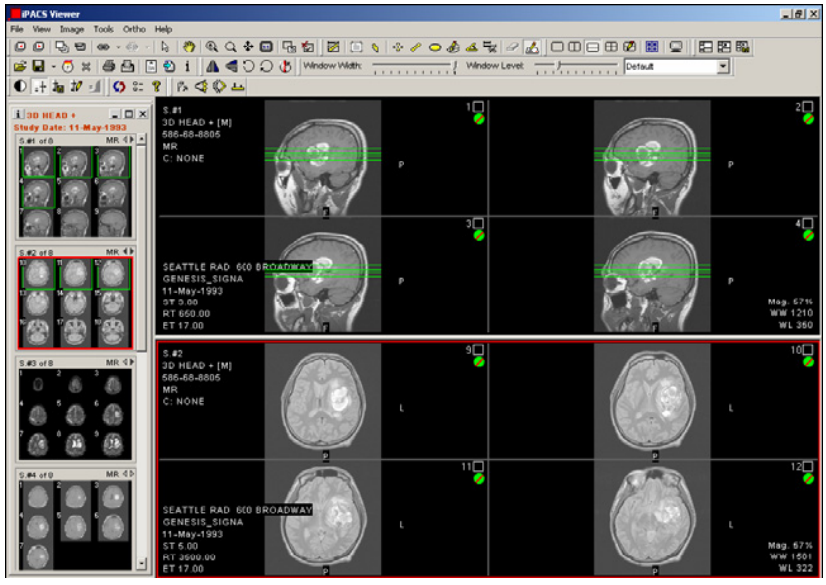
Using Cut Lines

When viewing studies, iPACS Viewer can display cut lines of the active slices on series from other directions (For example, axial slices on sagittal slices and vice versa).

Cut lines are limited to slices of the same study. The cut lines of the active series, which is indicated by a red border, will be displayed on the other non-parallel series opened in the main view.





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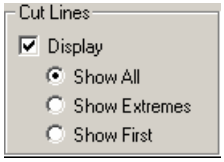
Cut Lines have several possible states:



- **Display**—Display all cut lines. If unselected, hides all cut lines.
- **Show All**—Show all cut lines corresponding to all displayed slices in the active series. (Default)
- **Show Extremes**—Show only the first and last cut lines of the displayed slices in the active series.
- **Show First**—Show only the first cut line of the displayed slices in the active series.

Changing the settings of cut lines in the **Settings** > **Overlays** dialog box will apply to all of the series displayed.

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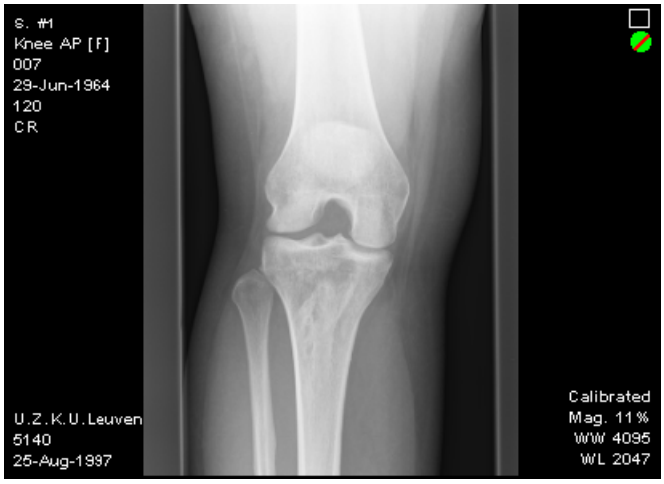
Annotations

Calibration Tool

Calibration can be done at the modality level at the time of image acquisition and then adjusted to the exact plane of the image. Calibration can also be done manually using a known distance on the image.

On the Annotations tool bar, there is a button for calibration and selection of orientation plane (AP/LAT). The calibration of images is performed per series, not per study.



To Manually Calibrate the Image:

1. Open the image in the main view.
2. Click the **Calibration** button.

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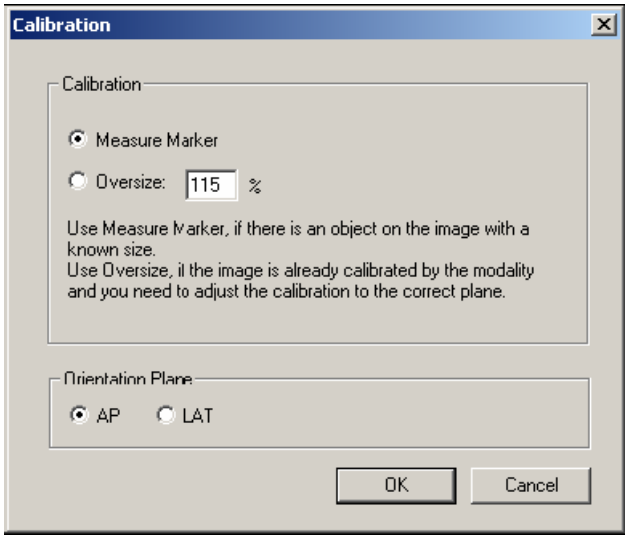
3. The Calibration dialog opens.



4. Select the method of Calibration: **Measure Marker** or **Oversize**.
5. Select Orientation Plane: **AP** or **LAT**.
6. The word *Calibrated* is added to the lower right corner on the image.

If the image has no pixel spacing in the DICOM header, **Oversize** is disabled and calibration can only be done using **Measure Marker**.

Using Measure Marker

If the image is not scaled at the modality level, it is then necessary to calibrate the image using **Measure Marker**. This measures a known distance on the image and calibrates the image according to your input.

If you select **Measure Marker**, the cursor changes to the line tool and you can draw a measurement line along a known distance. The actual measurement, according to the current calibration, is displayed.

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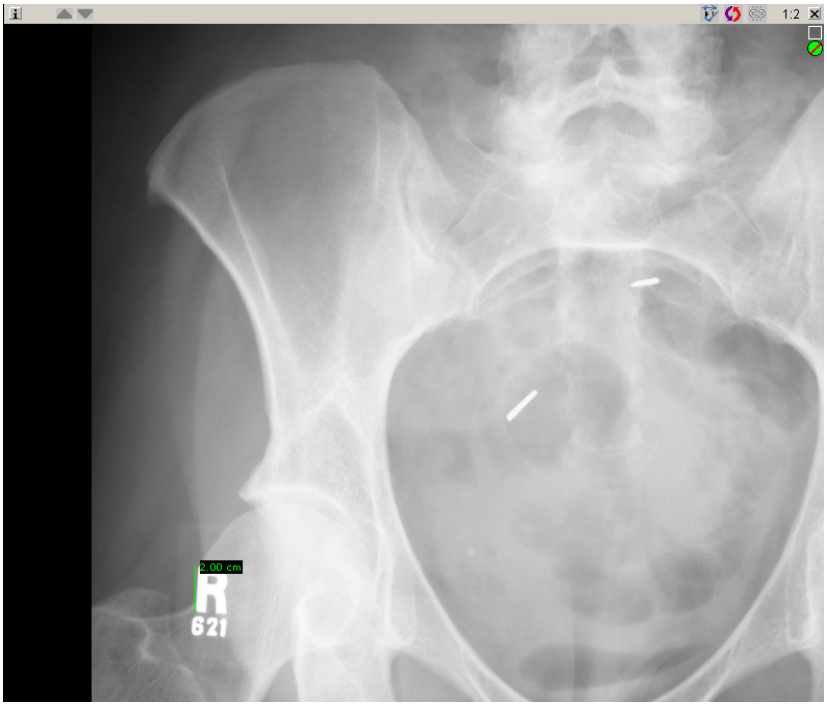
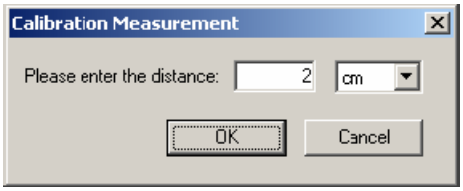
The following image shows how to use the Measure Marker option to measure a known distance. In this case, the R/L indicator is always two centimeters.



When you finish drawing the line, the Calibration Measurement dialog opens to enter the known distance.



After you click **OK**, the image calibration is updated and all measurements on the image are changed to their new values (including the measurement of the calibration distance).

Using Oversize

Oversize is enabled only when the image is already scaled at the modality. Image calibration is performed at the table height, so that there might be a slight difference in the calibration at the actual plane of the surgery planning. It is therefore recommended that the user always enter a calibration factor using Oversize, even when the image is scaled in the modality.

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If you select **Oversize**, the current calibration is updated according to the oversize value. All measurements on the image of the calibrated study will be updated. The default value for the Oversize of a hip or knee image is 115%.

Orientation of the Image

The Orientation of the image must be set either as AP or LAT.

- AP—Anterior Posterior—An X-ray image taken from front-to-back.
- LAT—Lateral—An X-ray image taken from the side.

After Calibration is performed, the word Calibrated is added to the lower right annotation on the image, showing that the image is calibrated.

The calibration and plane orientation are specific for the series. If you open two series, they will need to calibrate them separately.

The calibration is not saved between sessions. If you close the study and open it again, they will need to calibrate the images again.

Text Tool

Click on the **Text** button on the toolbar to activate the Text annotation tool.

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To Write a Text Annotation on the Image:

1. Click on the **Text** button and then click on the image in the main view.
2. The Insert Text dialog box opens and you can enter the text.
3. Click **OK** to close the dialog box and the text will appear on the image.
4. Press **ESC** to exit the annotation tool.

- You can edit a text annotation by double clicking on the text or right click and choosing Edit from the pop up menu.
- You can delete a text annotation by clicking on the text and pressing delete key on the keyboard or right clicking on the text annotation and choosing Delete from the pop up menu.
- You will be asked to confirm deletion of the annotation. This can be turned off by checking "Don't ask me again."
- The Text Annotation can be saved as a DICOM Overlay on the server, so other users can view it as well.

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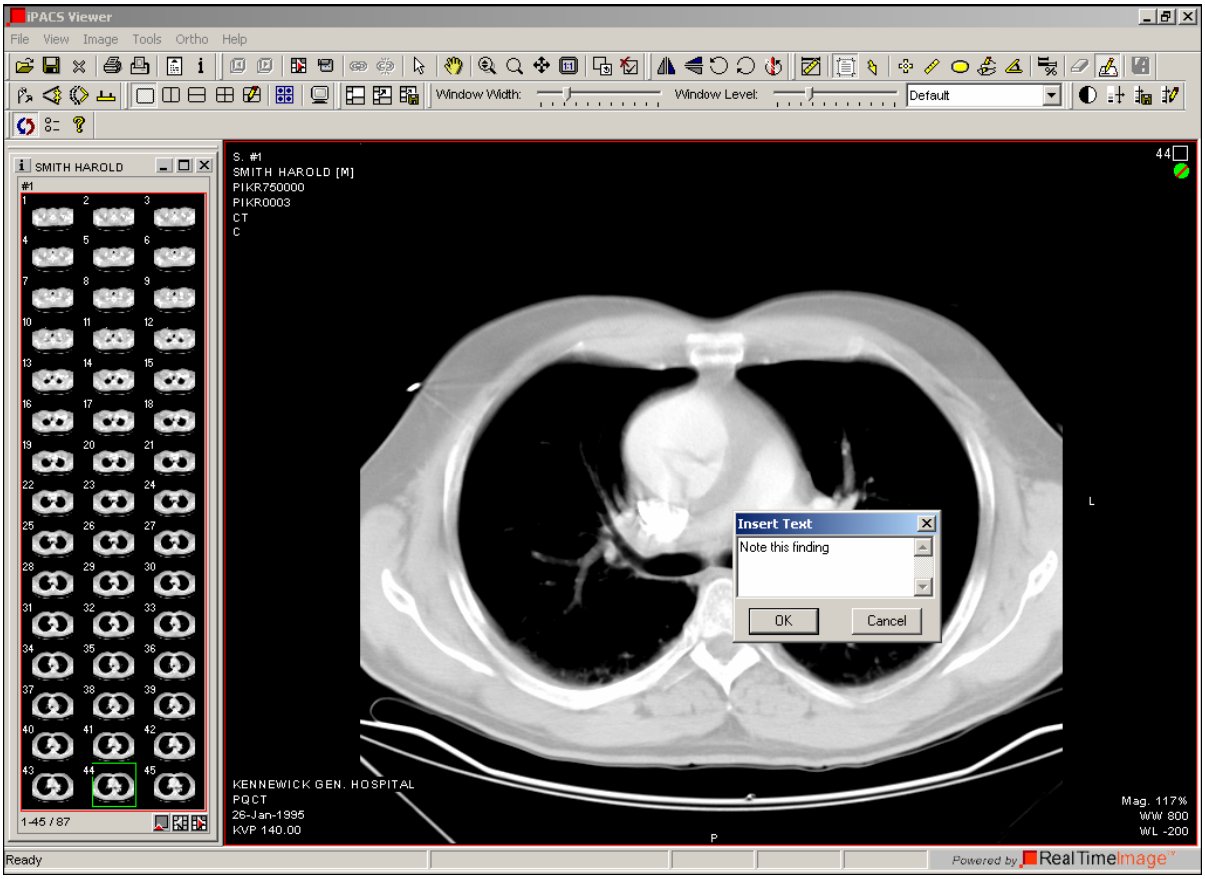
An example of the of the text annotation tool is shown below.



Arrow Tool

Click on the **Arrow** button on the toolbar to activate the arrow annotation tool.

To Add an Arrow Annotation on the Image

1. Click the **Arrow** button and then click on the image in the main view.
2. The first click will draw the end point of the arrow; drag the mouse in the image to elongate the arrow, and the end point is the head of the arrow.
3. Drawing is allowed only in one image/slice area where the first point of the arrow has been drawn.
4. Click **ESC** to exit the annotation tool.
5. You can edit an Arrow annotation by double clicking on the arrow or right click and choosing Edit from the pop up menu.

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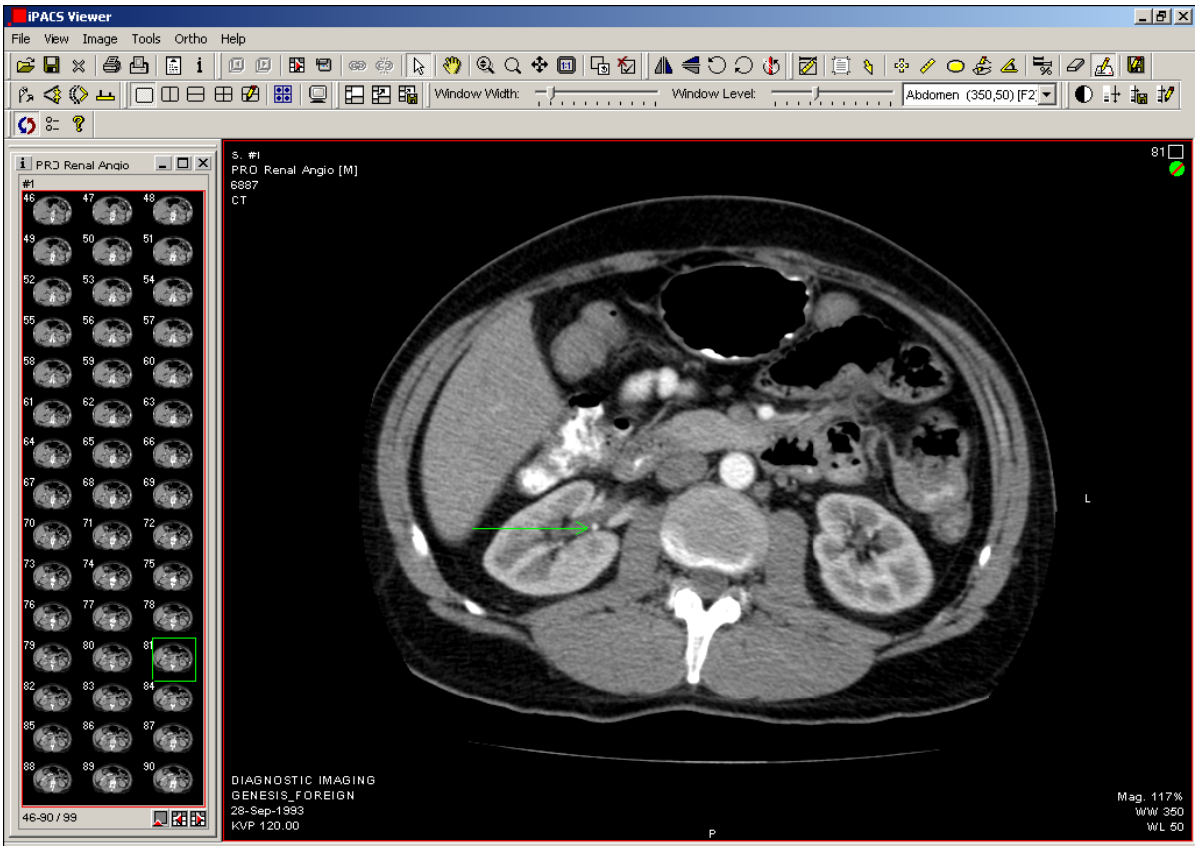
6. When editing the Arrow, the points will be highlighted and you will be able to move them
7. You can delete an Arrow annotation by clicking on the arrow and pressing delete key on the keyboard or right clicking on the Arrow annotation and choosing Delete from the pop up menu.
8. You will be asked to confirm deletion of the annotation. This can be turned off by checking "Don't ask me again."

The Arrow Annotation can be saved as a DICOM Overlay on the server, so other users can view it as well.



Pixel Intensity Tool

Click on the **Pixel Intensity** button on the toolbar to activate the Pixel Intensity annotation tool.

To Measure the Pixel Intensity of a Point on the Image

1. Click on the **Pixel Intensity** button and then click on the image in the main view.

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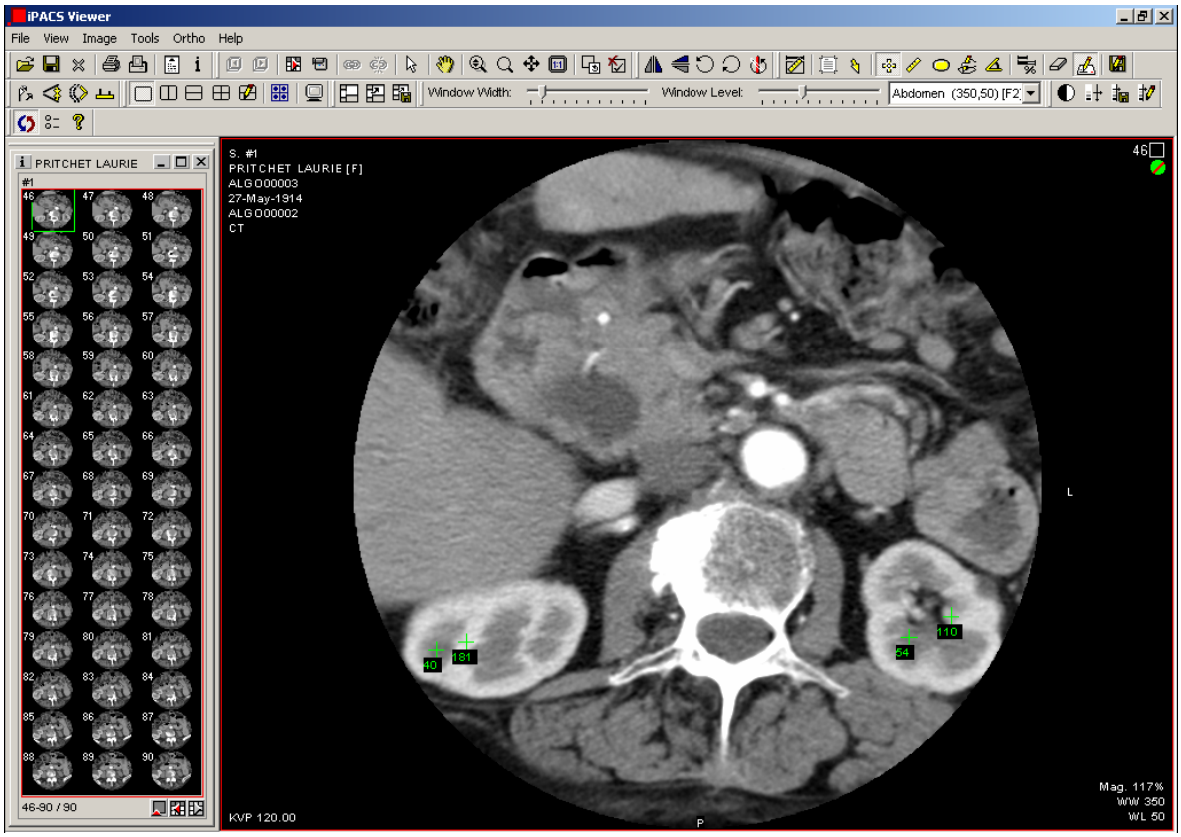
2. The pixel intensity in Hounsfield unit appears on the image.
3. You can move the annotation by selecting the Select tool and clicking on it. The measurement is automatically updated.
4. Press **ESC** to exit the annotation tool.
5. You can delete the pixel intensity annotation by clicking on it and pressing delete key on the keyboard or right clicking on the annotation and choosing Delete from the pop up menu.
6. You will be asked to confirm deletion of the annotation. This can be turned off by checking "Don't ask me again."

The Pixel Intensity Annotation can be saved as a DICOM Overlay on the server, so other users can view it as well.

In the following, we measure pixel intensity of the kidneys:



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Line Tool

Click on the **Line** button on the toolbar to activate the line annotation tool.

To Draw a Line on the Image:

1. Click on the left mouse button at the desired start point and drag the line up to the end point of the measurement.
2. Drawing is allowed only in one image/slice area where the first point of the line has been drawn.
3. The start point of the line cannot be changed during the line drawing. The line can be updated afterwards by clicking on it.
4. The line measurement is written in a text box near the end point of the line. It is updated during the line drawing. By default, the measurement is in cm. It can be changed to mm, inches, or pixels in the Settings dialog box.
5. Press **ESC** to exit the annotation tool.
6. You can delete the line annotation by clicking on it and pressing delete key on the keyboard or right clicking on the annotation and choosing Delete from the pop up menu.
7. You will be asked to confirm deletion of the annotation. This can be turned off by checking "Don't ask me again."

The line Annotation can be saved as a DICOM Overlay on the server, so other users can view it as well.

Accuracy of the measurements depends on original pixel size and correct zoom factor. For example, if original pixel size is 1 mm per pixel, in zoom factor of 1:4, the accuracy is ±4mm. In a zoom factor of 1:1, the accuracy is ±1mm. If there is no DICOM pixel spacing information for the image, the measurement will be in pixels. You can calibrate the image using some marker captured on the image.

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In the following image, we measure the bone:

Ellipse Tool

Click on the **Ellipse** button on the toolbar to activate the annotation tool.

To Measure an Ellipse on the Image

1. Clicking in the main view opens a measurement ellipse.
2. To change the width and height of the ellipse, click on one of the measurement squares and drag the mouse until you reach the desired size.
3. The mean pixel intensity, in Hounsfield units for CT, the area, and the perimeter of the ellipse is written near the ellipse.
4. Click ESC to exit the annotation tool.
5. You can delete the ellipse annotation by clicking on it and pressing delete key on the keyboard or right clicking on the annotation and choosing Delete from the pop up menu.
6. You will be asked to confirm deletion of the annotation. This can be turned off by checking "Don't ask me again."

The Ellipse Annotation can be saved as a DICOM Overlay on the server, so other users can view it as well.

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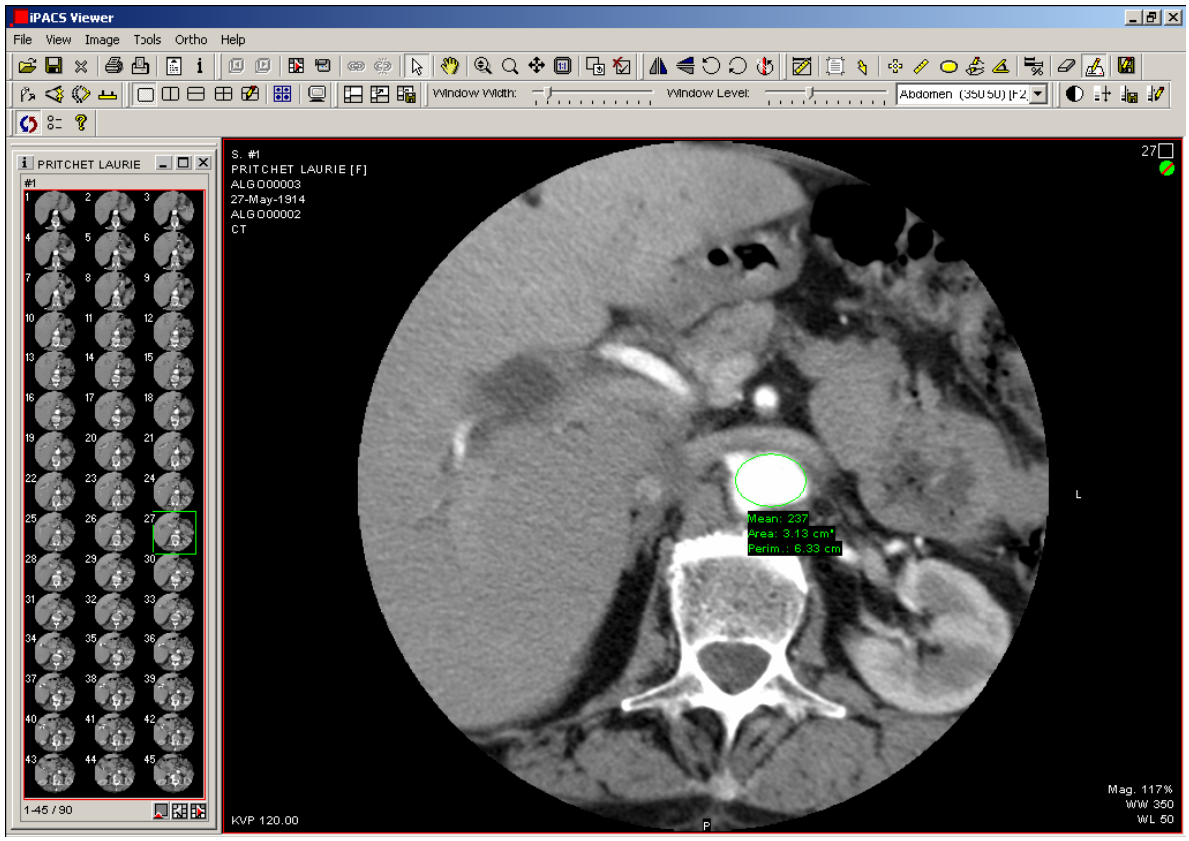
In the following, we measure the aorta:



Free Hand

Click on the **Free Hand** button on the toolbar to activate the Free Hand annotation tool.

To Add a Free Hand Annotation on the Image

1. Click on the **Free Hand** button and then click on the image in the main view.
2. Draw the shape by keeping the left mouse button pressed on the image. Drawing is allowed only in one image/slice area where the first point of the shape has been drawn.
3. The shape will close automatically between its start point and its end point.
4. Click **ESC** to exit the annotation tool.
5. You can edit a Free Hand annotation by double clicking on it or right click and choosing Edit from the pop up menu.

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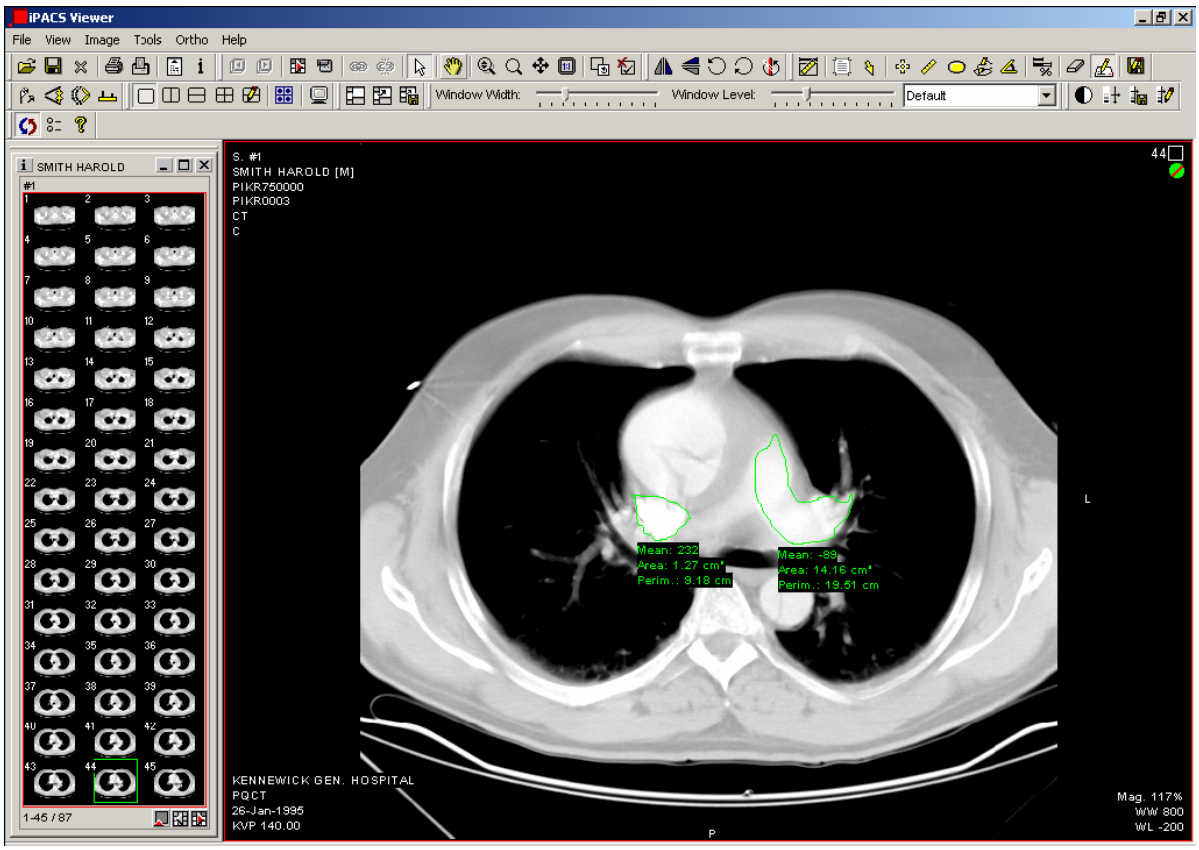
6. You can delete a Free Hand annotation by clicking on it and pressing the delete key on the keyboard or right clicking on the Free Hand annotation and choosing Delete from the pop up menu.
7. You will be asked to confirm deletion of the annotation. This can be turned off by checking "Don't ask me again."

The Free Hand Annotation can be saved as a DICOM Overlay on the server, so other users can view it as well.



Angle Tool

Click on the **Angle** button on the toolbar to activate the annotation tool.

To Measure an Angle on the Image:

1. Click on the left mouse button at the desired start point.
2. Draw the first line of the angle by moving the mouse. Another single click sets the corner of the angle.
3. Draw the second line of the angle by moving the mouse.

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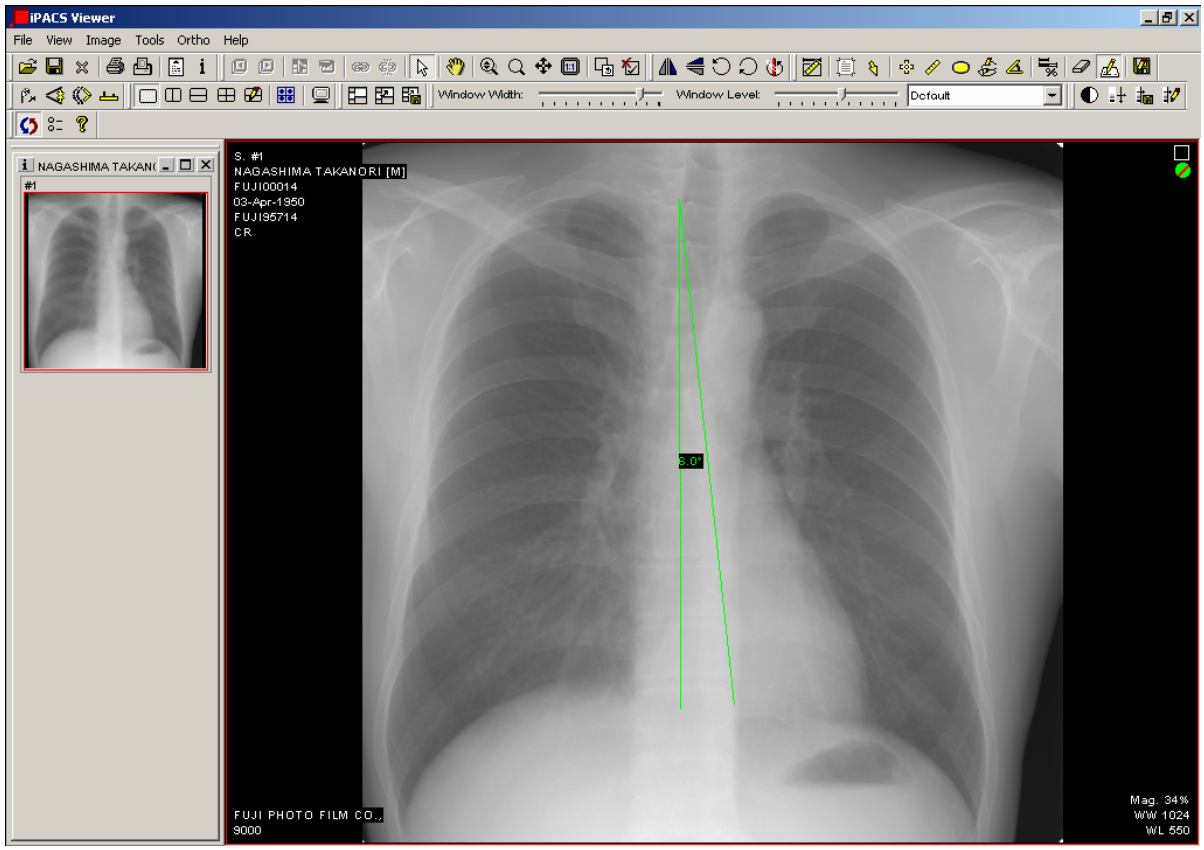
4. Clicking the mouse button again at the desired end point ends the angle measurement.
5. The measurement in degrees is written in a text box inside the angle near the inner corner. It is updated during the measurement process.
6. Drawing is allowed only in the image area when the first point has been drawn.
7. Click **ESC** to exit the annotation tool.
8. You can delete an Angle annotation by clicking on it and pressing the delete key on the keyboard or right clicking on the Free Hand annotation and choosing Delete from the pop up menu.
9. You will be asked to confirm deletion of the annotation. This can be turned off by checking "Don't ask me again."

The Angle Annotation can be saved as a DICOM Overlay on the server, so other users can view it as well.

In the following, we measure the spinal curvature:



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Cardio Thoracic Tool

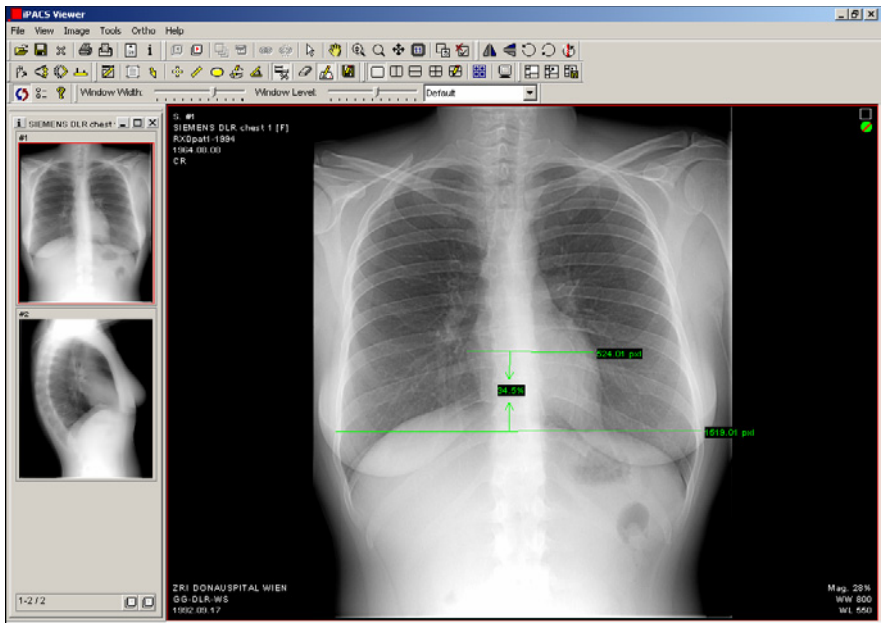
Click on the **Cardio Thoracic** button on the toolbar to activate the Cardio Thoracic annotation tool. This tool measures the Cardio Thoracic ratio, the percent difference between two line lengths.

To Measure the Cardio Thoracic Ratio on the Image

1. Draw two lines on the image using the Line tool.
2. Click on the left mouse button on the first line.
3. Click the mouse button again on the second line.
4. A line is drawn between the two selected lines.
5. The measurement in percentage is written in a text box between the two lines.
6. Drawing is allowed only in the image area when the first point has been drawn.
7. Click **ESC** to exit the annotation tool.
8. You can delete a Cardio Thoracic ratio annotation by clicking on it and pressing the delete key on the keyboard or right clicking on the Free Hand annotation and choosing Delete from the pop up menu.
9. You will be asked to confirm deletion of the annotation. This can be turned off by checking "Don't ask me again."

The Cardio Thoracic ratio can be saved as a DICOM Overlay on the server, so other users can view it as well.

In the following, we measure the Cardio Thoracic ratio:



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Delete All Annotations

Deletes all annotations on active images. You will be asked to confirm deletion of the annotations. Checking "Don't ask me again" can turn this off.

Display/Hide Overlays

Displays/hides all overlays on all displayed images or series.

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OrthoPlanner (Optional)

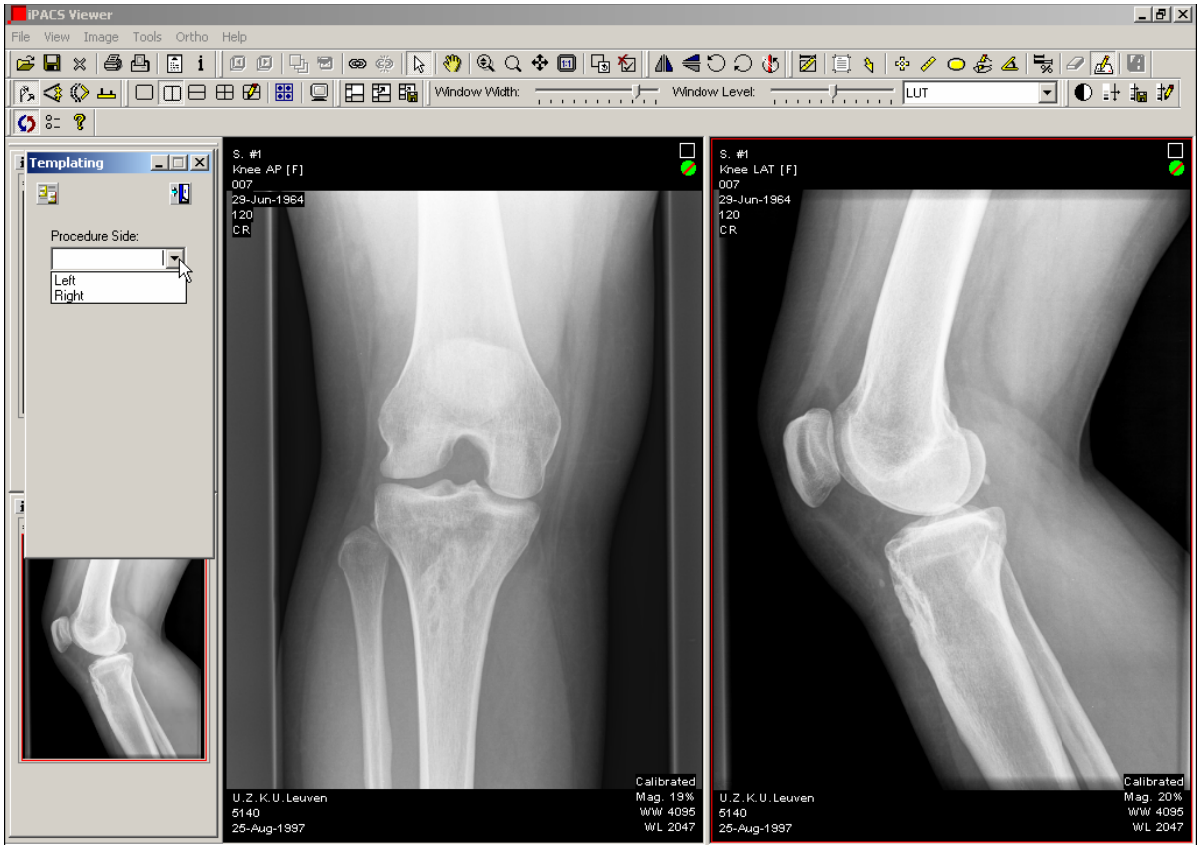
The orthopedic module (optional) allows orthopedic surgeons to use specific measurement tools for diagnosis and for planning total joint replacements.

Templating

Templating allows you to perform surgical planning for total joint replacement. Templating includes the exact selection and positioning of digital templates on the image, as well as creation of an Ortho report for preoperative planning. Before starting digital planning on image, you need to calibrate the image. Exact instructions regarding downloading Digital Templates, can be found in Orthopedic Template Settings (Optional) on page 106.

To Begin Using Digital Templates

1. Click on Ortho Templating on the toolbar to open the Templating dialog box.



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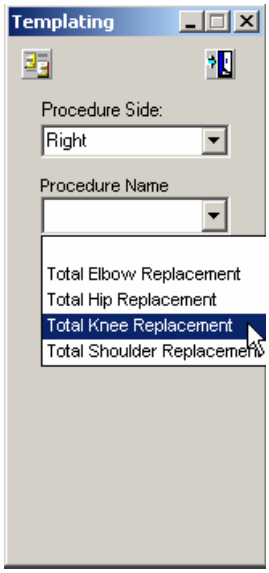
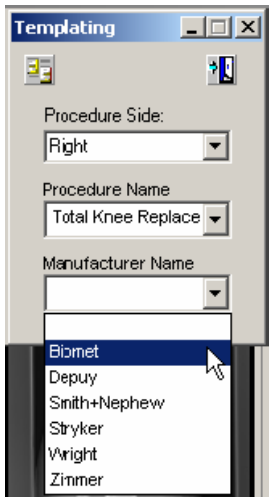
2. In the **Procedure Side** field, select **Left** or **Right** from the drop down list.
3. In the **Procedure Name** field, select one of the displayed procedures, such as **Total Hip Replacement** or **Total Knee Replacement**.



4. In the **Manufacturer Name** field, select the manufacturer whose templates you want to work with.



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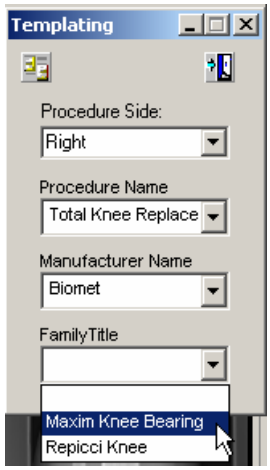
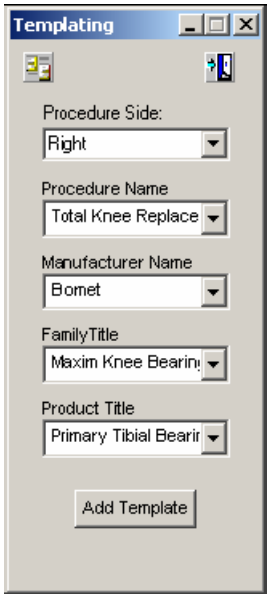
5. In the **Family Title** field, select the family title of the template that you want to work with.



6. In the **Product Title** field, select the product title of the template that you want to work with.



7. Click **Add Template** to add it to the list of templates.

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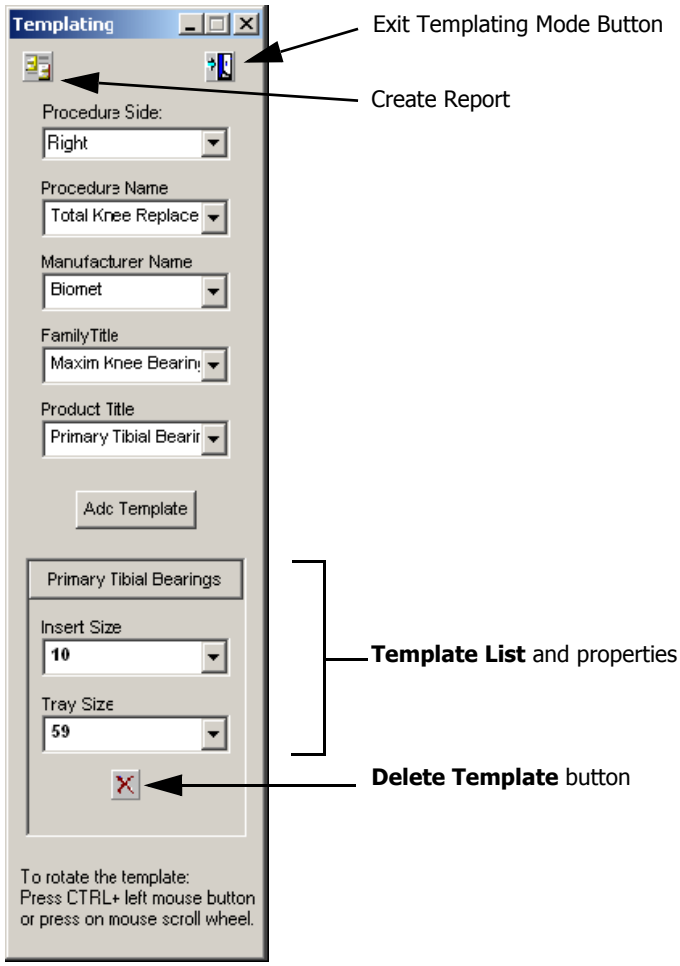
8. A list of properties specific to the template chosen is displayed. Select the values desired to place the template on the image.



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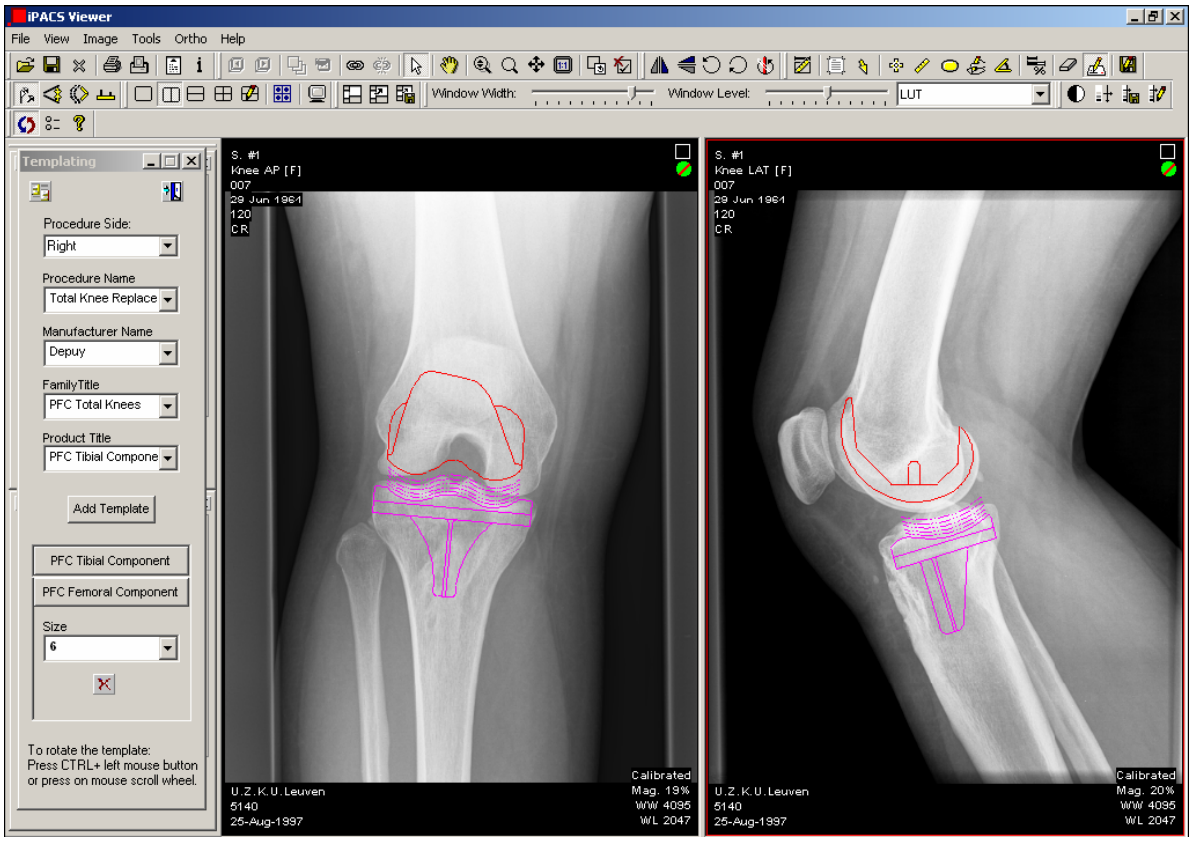

9. The template will be drawn according to the Plane orientation set by you (AP or LAT). If images in both planes are opened and calibrated, the template will be displayed on both.

When you right click on the template, a special popup menu is displayed with the following options:

- Template Parameters and their values
- Flip
- Delete

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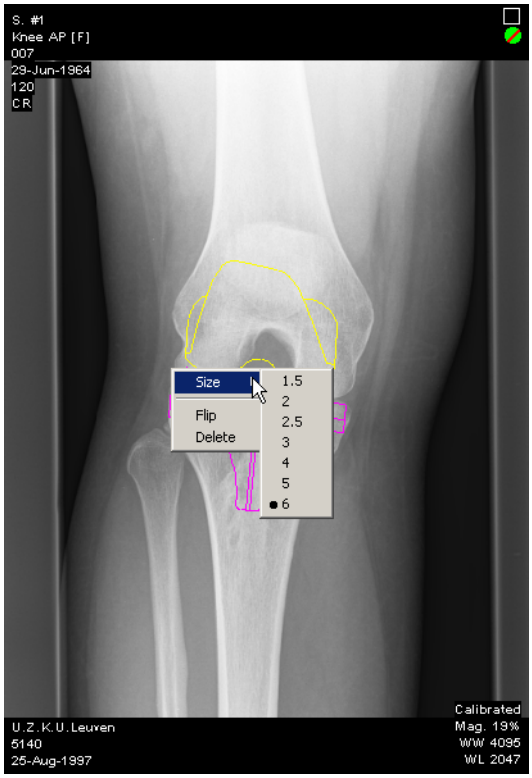

Whenever the size of the template is updated from the Templating window or from the right click menu, the template on the image will change according to the new template parameters chosen.

Selecting **Delete** will remove the template from the image and the Template List.

How to Move and Rotate the Template

To Move the Template

Click and drag the template to the new location.

To Rotate the Template

1. Select the template with the mouse.
2. Press down on the mouse scroll wheel.
3. The cursor changes to the rotate cursor.
4. Move the mouse in a circular path.

OR

1. Select the template with the mouse.
2. Press **CTRL** and the left mouse button.
3. The cursor changes to the rotate cursor.

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4. Move the mouse in a circular path.

The template moves with the image if the image is panned and rotates/flips if the image is rotated or flipped.

You can move or rotate the template while in Template Mode. If you have done measurements on the image, you may not be in Template Mode. To return to Template Mode, click on the Ortho Templating button on the toolbar.

Save Template

After you have selected and placed the template properly on the image, you can save this information in several ways.

- **Save as Annotation**—Save the template as an annotation on the image. The template is saved as a Presentation State file on the server and can be viewed by other users.
- **Save as Report**—Generate a report that includes the details of the template (manufacturer, part number, etc) and a screenshot of the template on the image.
- **Copy to Clipboard**—Copy the image with the template to the clipboard, where it can be pasted into an image editor program and saved.

How to Create a Template Report

After the templates have been selected and placed on the image, you can generate a report. The report contains patient information, template information, and an image of the template positioned on the x-ray.

To Generate a Template Report

1. Perform any measurements desired on the image.
2. Select templates and position them on the image.
3. Click on the Create Report button in the Templating floater.

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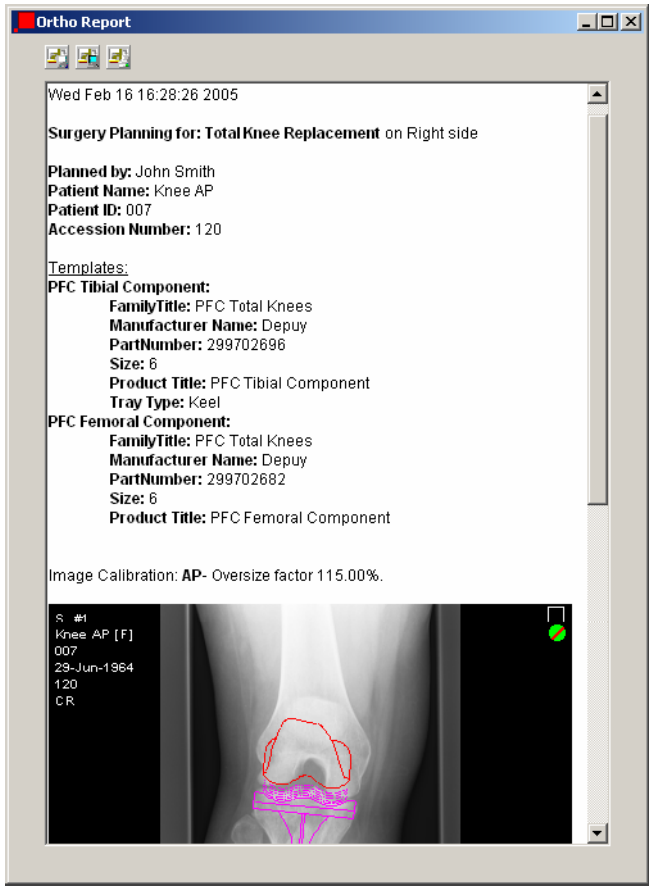
4. A report is generated and opened in the Ortho Report window.



5. After the report is generated choose to:
   - **Save to Local File**—Save the report as an rtf file on the local machine. Other users cannot view the report.
   - **Save to Server**—Save the report as an rtf file on the server. Other users can view the report through the Study Browser.
   - **Print Report**—Print the report to the local windows printer.

Angle Between Two Lines

Measures the angle between two lines. You select the angle tool and then clicks on the two lines that you want to measure the angle between them. The resulting angle between the two lines will be displayed.

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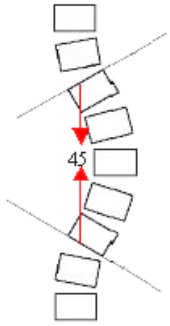
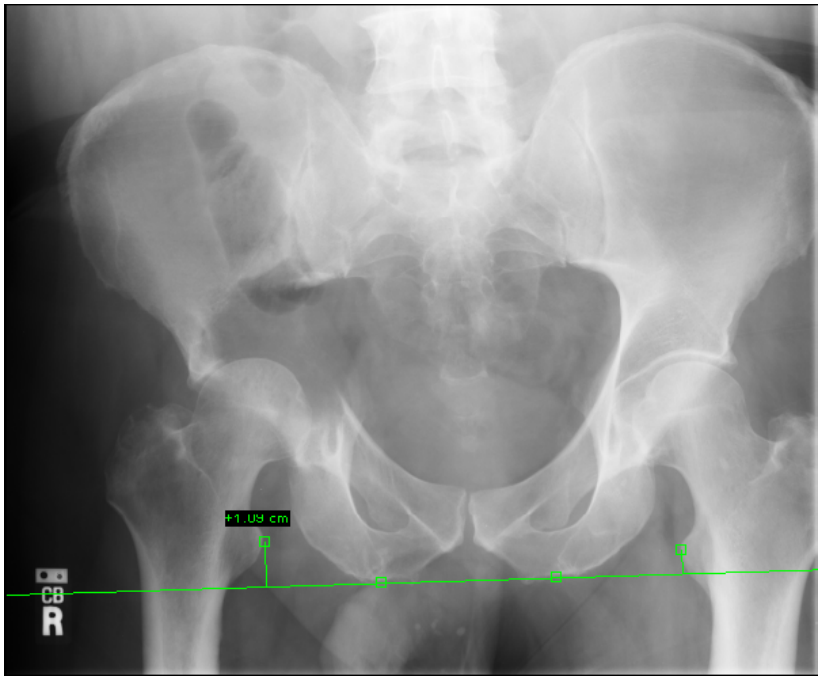
Cobb Angle (For Spine Scoliosis)

Measures the Cobb angle used for spine scoliosis (angle where the two lines drawn on the spine meet).



Transischial Line (For Total Hip Replacement)

Draws a transischial line on the image and measures the difference in height of the two perpendicular lines. Transischial line is used to compare right and left lesser trochanter positions to determine leg length.



To Draw a Transischial Line on the Image

1. Click on the **Transischial Line** button on the toolbar.

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2. Click on the image. A horizontal line with two holding points will be drawn on the image.
3. The horizontal line can be rotated, as needed, using the holding points.
4. Two perpendicular lines are drawn to the horizontal line.
5. Drag the end points of the perpendicular to change their length and position on the horizontal line.
6. The difference in length of the two perpendicular lines is displayed.

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Settings

To change your preferences, click on the Settings button in the toolbar. These settings will be stored on your computer and will be used every time you open the iPACS Viewer.

Hanging Protocol Settings (Optional)

The Hanging Protocol defines how you want the iPACS Viewer to automatically open the studies or series. This includes screen layout, series layout, zoom, windowing, and orientation.

The Hanging Protocol Wizard consists of three steps:

1. Hanging Criteria—Determines when the Hanging Protocol will be automatically applied upon opening a study.
2. Screen Arrangement—How the study will open across monitors.
3. Series Arrangement—How the different series of the study will open within the above screens

When Default Hanging Protocol or other Hanging Protocols are activated, the images are opened directly in the main view, according to the applied Hanging Protocol.

Creating new Hanging Protocols is an optional license based feature. If you don't have the appropriate license, you will only be able to change the default Hanging Protocol.

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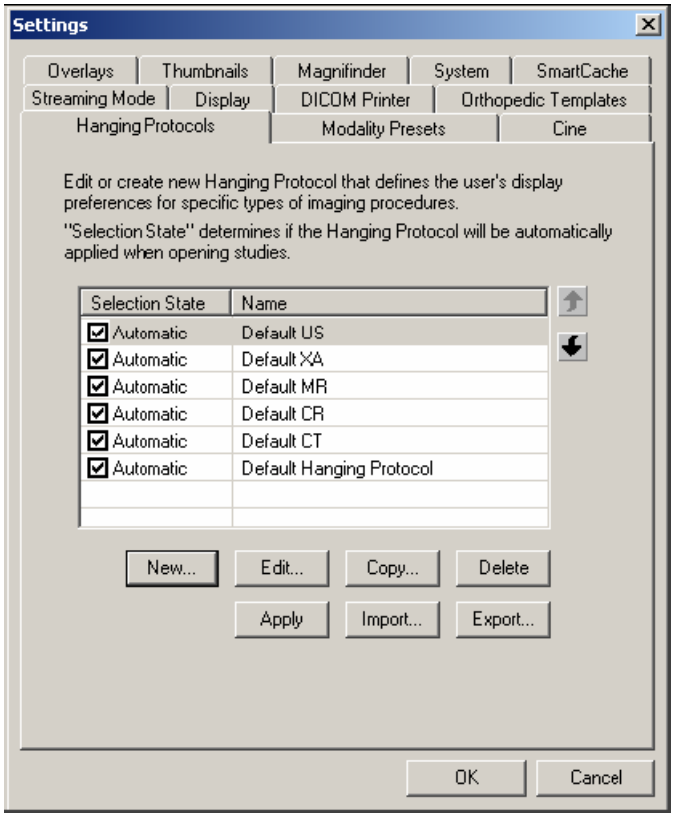

- **Selection State**—If Automatic is checked, the Hanging Protocol will be automatically applied if the study fulfils the Hanging Criteria. If Automatic is not checked, Hanging Protocol is only applied if manually selected.
- **New**—Opens a window that allows definition of a new Hanging Protocol.
- **Edit**—Opens a window for altering an existing Hanging Protocol.
- **Copy**—Saves the current Hanging Protocol under a new name.
- **Delete**—Deletes the selected Hanging Protocol.
- **Apply**—Applies the selected Hanging Protocol on the studies currently opened in the Viewer.
- **Import**—Imports an existing .hpr xml file with Hanging Protocol definitions.
- **Export**—Exports the Hanging Protocol into an xml file (with extension hpr).

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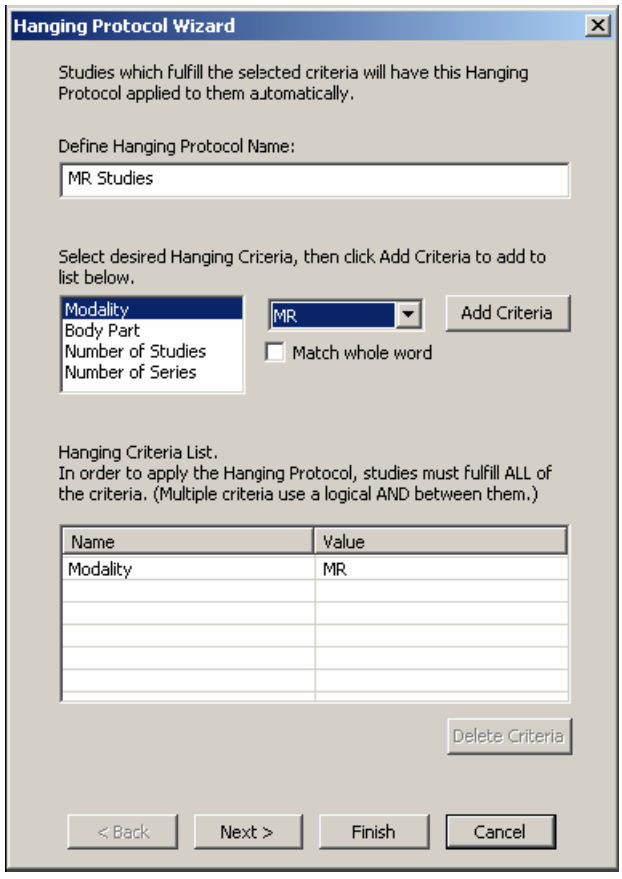
Arrows allow changing priorities between Hanging Protocols. If a study opened corresponds to more than one existing hanging protocol, the one with the highest priority will be applied.

Creating/Editing a Hanging Protocol

To Create a New Hanging Protocol

1. Click **New** to create a new Hanging Protocol or **Edit** to change an existing one.
2. The Hanging Protocol Wizard dialog box opens.
3. Enter a Name for the Hanging Protocol. For example, MR Studies.
4. Select desired Hanging Criteria, for example Modality equals MR.
5. Click **Add Criteria** to add it to the Hanging Criteria list. Use this hanging protocol for studies that fulfill the selected hanging criteria.



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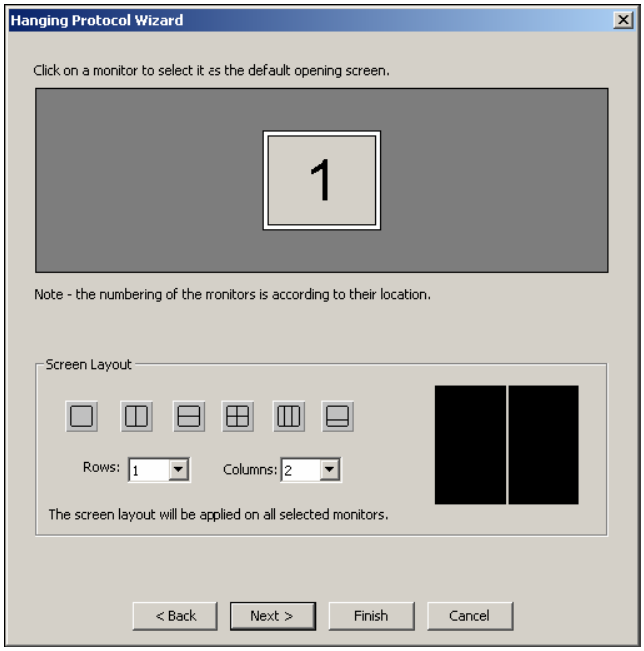
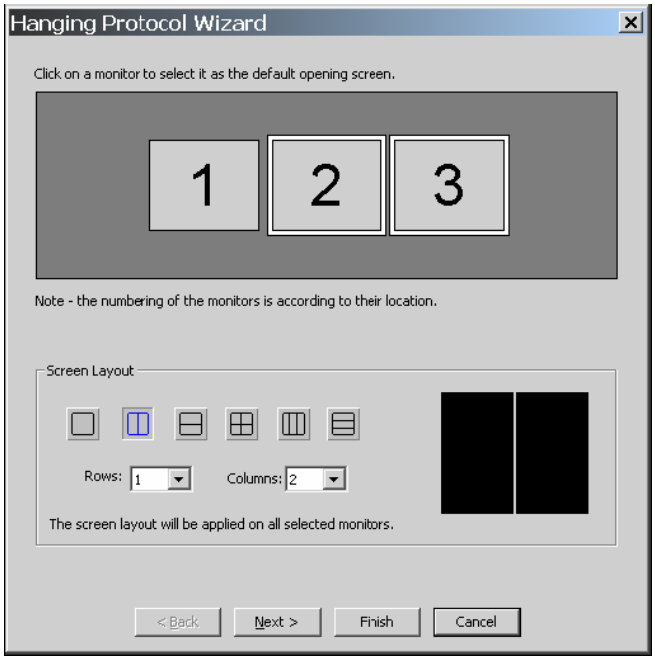
6. Click **Next** to define monitor and screen layout.



7. If you have more than one monitor, you can select which monitors to open the Viewer on. Just click on the monitor you want to act as the default opening screens.



8. **Screen Layout**—The screen layout can be set in order to always open images or series in the main view. Set the

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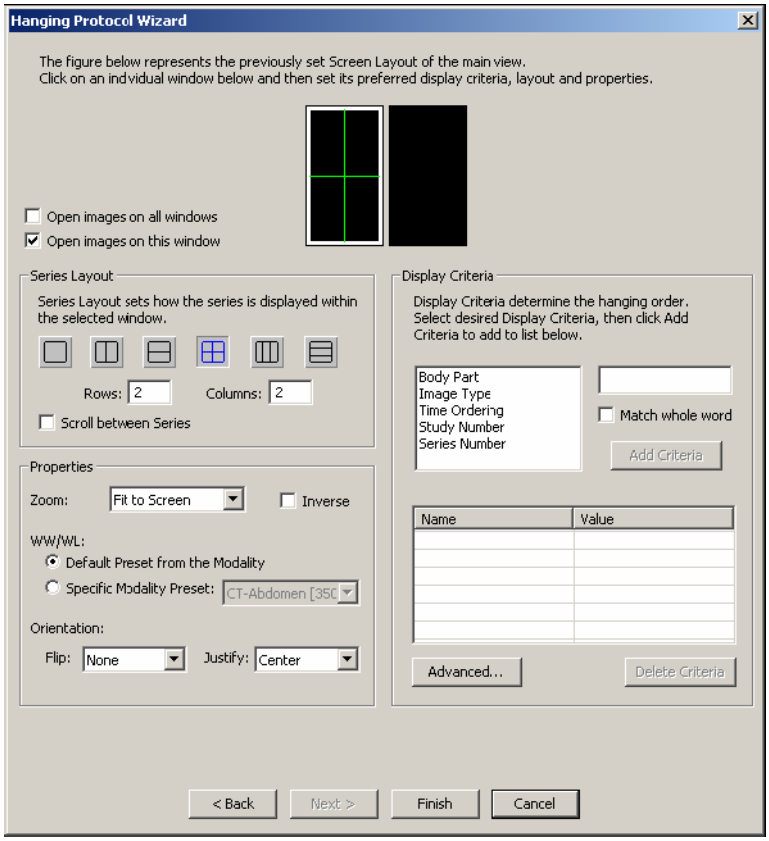
number of Rows and Columns, up to 4x4. Note that this setting is applied across all monitors.

9. Click **Next** to continue defining criteria for the Hanging Protocol.



10. **Open images on all windows**—When the Hanging Protocol is applied, the series/images automatically open on all windows.
11. **Open images on this window**—When the Hanging Protocol is applied, the series/images automatically open on this window.
12. Select **Series Layout**. Every time you open a series in the selected view, it will open with the preset series layout. You can set your own working preferences for each modality. Set the number of Rows and Columns, up to 16x16
13. **Scroll Between Series**—If this setting is enabled, you can automatically scroll between series using the mouse wheel. Note: If you have selected images, manipulated the image, applied measurements or annotations, these settings will not be saved when you move between series.

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14. Select **Display Criteria**. The Display Criteria determine the hanging order of the images or studies. For example, if you open two studies, you can set the Time Ordering criteria such that the latest study always opens on the right.
    - **Match Whole Word**—If entering values for certain criteria in the edit box, you can force to match whole word only in the Display Criteria.
    - **Advanced**—Define a Display Criteria according to a specific DICOM Tag.
15. Select **Properties** that you want the study to open with.
    - **Zoom**—Zoom Factor can be set as:
      - Fit To Screen
      - 2:1
      - 1:1
      - 1:2
      - 1:4
      - 1:8
    - **Inverse**
    - **WW/WL**
      - Default Preset from the Modality—Windowing is set according to the default values as received from the modality at the time of acquisition
      - Specific Modality Preset—Windowing can be set according to a predefined Modality Preset.
    - **Orientation**
      - Flip—Vertical or Horizontal
      - Justify—Right, Center, or Left
16. Click **Finish** to complete the creation of the Hanging Protocol.

When a study is opened in the Viewer while another study is already loaded, the Hanging Protocol is not applied automatically and the study is not opened in the main view.

Default Hanging Protocol

Default Hanging protocol has screen layout 1x1, series layout 1x1, default Modality Preset, Zoom equals Fit to Screen, and Justify equals Center.

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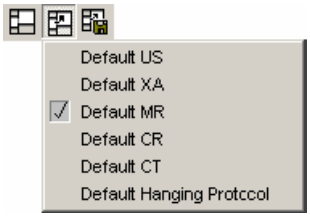
Open Hanging Protocol Tab

Opens the Hanging Protocol tab in the Settings dialog box. There you can create, edit, copy, apply, import, delete, and export Hanging Protocols.

Apply Hanging Protocol (Optional)

After images are opened in the main view, you will be able to apply a Hanging Protocol. A drop down for Hanging Protocol opens when clicking on Apply Hanging Protocol. All the pre-defined Hanging Protocols will be displayed. The Default Hanging Protocol will always appear as the last one in the list.



Save as Hanging Protocol (Optional)

Creates a Hanging Protocol based on the current Viewer settings. The Hanging Protocol created records Modality as Hanging Criteria, screen layout, series layout, and modality window presets.

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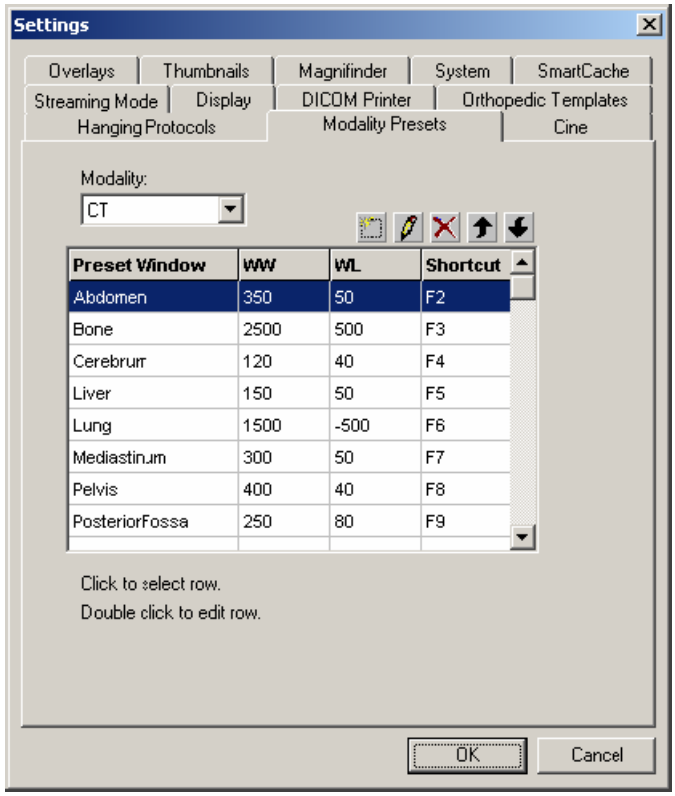
Modality Presets Settings

In the Modality Presets tab, you can define window level presets for each modality. The changes are reflected in the Preset drop down box on the toolbar and in the pop up menu.



To Add a New Preset Window Setting

1. In the **Modality** field, select a modality.
2. All Modality Presets will be displayed in the table.
3. To add a new Preset Window, double click on an empty row.
4. Click the row to select it. You can edit an item, delete an item, and move an item up and down, according to your personal preferences.

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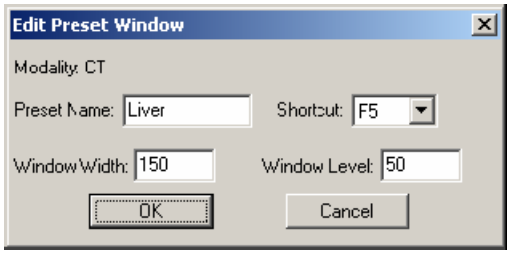
5. Double click on the row, to edit an existing field. The Edit Preset Window opens. In this way, change the preset name, WW, or WL.



6. Click **OK** to save your changes.

Use the following buttons when editing Modality Window Presets:

- Create a new Preset setting.
- Edit a Preset Window setting.
- Delete—Delete the selected Preset window setting.
- Move Item Up—Move the selected item up on the list. This change is reflected in the Preset drop down listbox on the toolbar and in the pop up menu.
- Move Item Down—Move the selected item down on the list. This change is reflected in the Preset drop down listbox on the horizontal toolbar and in the pop up menu.

By default, the CT modality has the following values:

- Default—Returns to the default WW/WL of the image that was embedded in the image DICOM header. If no value is indicated in the original DICOM file, the Default value is set according to the dynamic range of the image.
- Default 2—Returns to the secondary default WW/WL of the image, if it exists in original DICOM image.
- Abdomen (WW=350,WL=50) Shortcut = F2
- Bone (2500, 500) Shortcut = F3
- Cerebrum (120, 40) Shortcut = F4
- Liver (150, 50) Shortcut = F5
- Lung (1500, -500) Shortcut = F6
- Mediastinum (300, 50) Shortcut = F7
- Pelvis (400, 40) Shortcut = F8
- PosteriorFossa (250, 80) Shortcut = F9

Other modalities have no default preset window values. You can add as needed.

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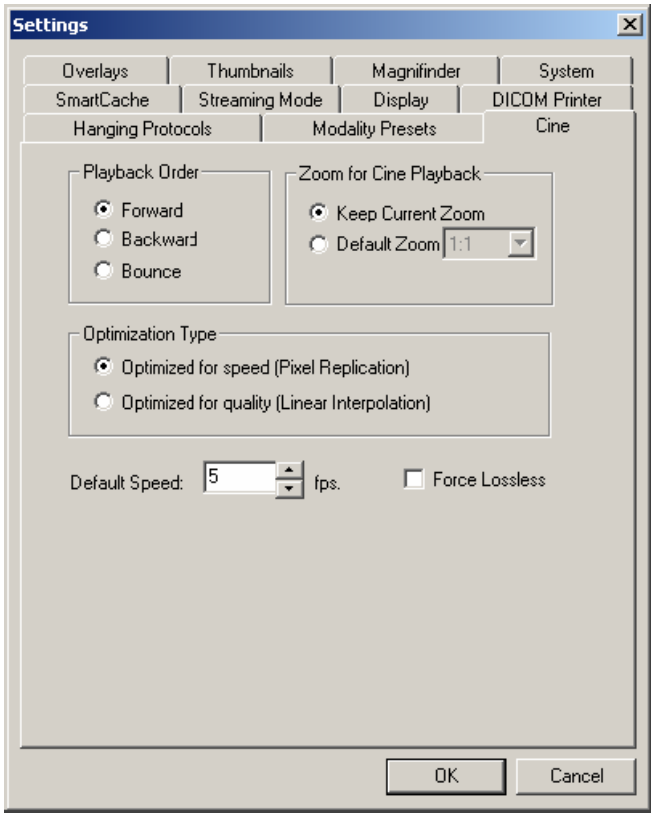
Cine (non-Cardio) Settings

In the Cine tab, you can define Playback Order, Zoom, Optimizations, Default Speed, and Image Quality.



The following can be selected:

- Playback Order:
  - Forward (First to Last, First to Last …) (Default)
  - Backward (Last to First, Last to First,…)
  - Bounce (First to Last, Last to First, First to Last,…)
- Zoom for Cine Playback:
  - Keep Current Zoom
  - Default Zoom
  - Fit To Screen
  - 2:1
  - 1:1
  - 1:2
  - 1:4
  - 1:8

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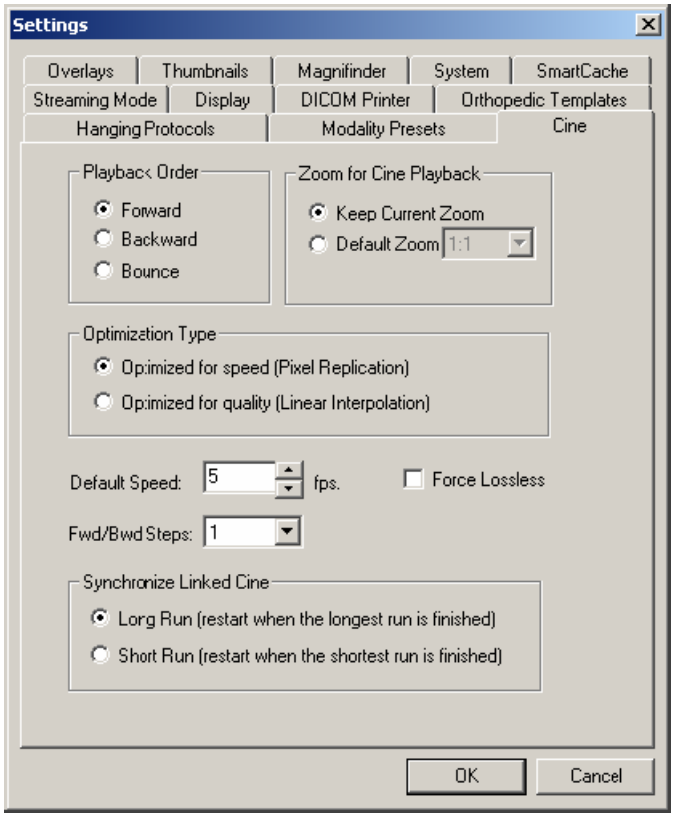
- Optimization Type:
  - Optimized for speed (Pixel Replication)—runs cine at fastest rate possible, but with lower quality
  - Optimized for quality (Linear Interpolation)—runs cine at high quality, but at a slower rate.
- Default Speed:
  - 1-30 frames per second (Default—5 fps)

Available computer memory and current resources can limit actual fps.

- Force Lossless—Check in order to view the Cine in Lossless View; meaning all data received for the current window level.

Cine (for Cardio) Settings

For Cardio users only in the Cine tab, you can define Playback Order, Zoom, Optimizations, Default Speed, Image Quality, and Cine Synchronization.



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The following can be selected:

- Playback Order:
  - Forward (First to Last, First to Last …) (Default)
  - Backward (Last to First, Last to First,…)
  - Bounce (First to Last, Last to First, First to Last,…)
- Zoom for Cine Playback:
  - Keep Current Zoom
  - Default Zoom
  - Fit To Screen
  - 2:1
  - 1:1
  - 1:2
  - 1:4
  - 1:8
- Optimization Type:
  - Optimized for speed (Pixel Replication)—runs cine at fastest rate possible, but with lower quality
  - Optimized for quality (Linear Interpolation)—runs cine at high quality, but at a slower rate.
- Default Speed:
  - 1-30 frames per second (Default—5 fps)

Available computer memory and current resources can limit actual fps.

- Force Lossless—Check in order to view the Cine in Lossless View; meaning all data received for the current window level.
- Fwd/Bwd Steps—Determines how many slices to jump forward or backward, when using the Step Forward/Step Backward buttons.
- Synchronize Linked Cine—When two cines are linked together, choose
  - Long Run (restart when longest run is finished)
  - Short Run (restart when shortest run is finished)

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Streaming Mode Settings

Streaming Mode selects the bandwidth adaptation model that best corresponds to the current network connection speed. The purpose of Streaming Mode is to automatically choose the streaming model according to client's bandwidth.

In the Settings dialog box, Streaming Mode settings are set for a specific server. The changes will be implemented when the next study is opened. When the bandwidth is more or less constant, the required model can be set once in the settings using manual.

To open the Settings dialog box for the specific server, click on the **Settings** or **Streaming Mode** buttons.

In this tab, the following values appear:

- **Server**: Displays name of the last server that was connected. In the drop down list box are all the servers that were connected in the past.
- **Monitored Speed**: Displays the connection speed for the specified server. Displayed in Kbps, Mbps, or Gbps. In case there is not enough data to estimate the connection speed, NA-Not Available will be displayed.
- **Bandwidth Adaptation**—
  - **Automatic**—iPACS automatically chooses the bandwidth model according to detected connection speed.
  - **Manual**—you set the bandwidth model that iPACS will work with, according to a known connection speed.

    DSL and below model—suitable for low bandwidth, below a specified threshold (set by default to below 5 Mbps)

    LAN model—best suitable for medium bandwidth, between the defined thresholds (set by default between 5Mbps and 70 Mbps)

    Fast LAN model—best suitable for fast bandwidth, above the defined threshold (set by default to above 70 Mbps)
  - **No Progressive Streaming**—removes progressiveness during viewing, providing full quality and full resolution images, but at a delay to viewing.

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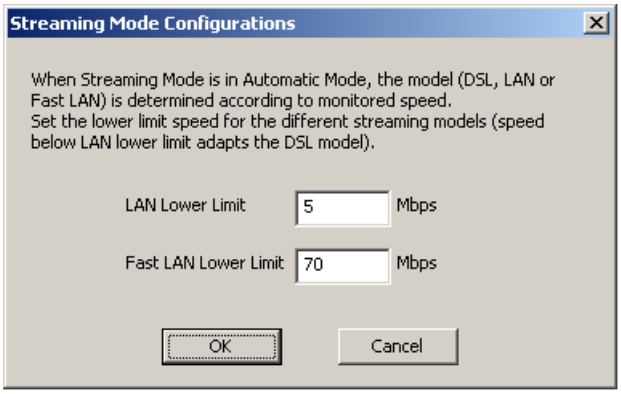
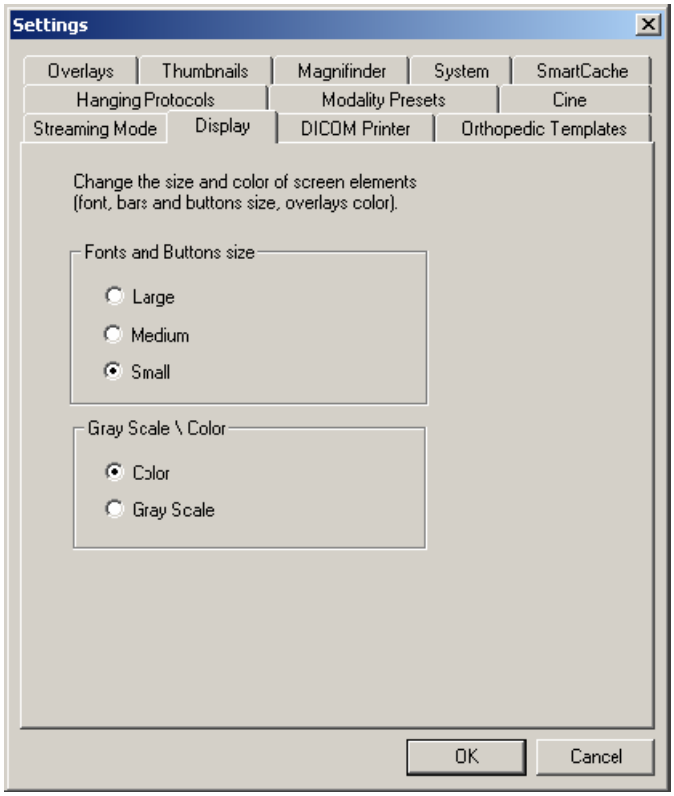
Click **Advanced** to manually configure Streaming Mode. This opens the Streaming Mode Configurations dialog, where you can set the lower speed limits for LAN and Fast LAN models. This should be used only if recommended by your support.



Display (optional) Settings

Changes the size and color of screen elements in the Viewer. This is especially useful for high-resolution monitors and grayscale monitors.



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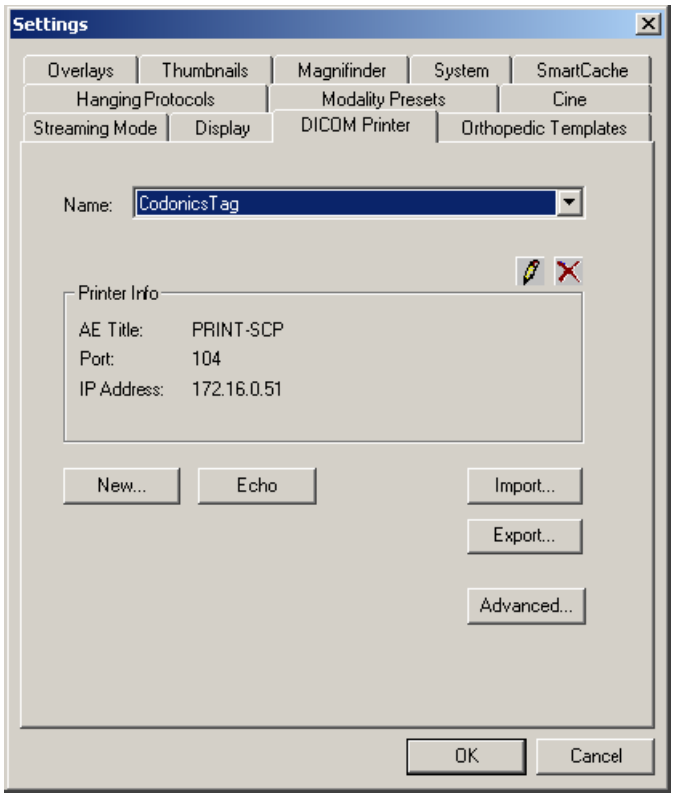
DICOM Printer Settings (Optional)

iPACS Viewer allows you to define multiple DICOM Printers, if the iPACS server is installed with the appropriate license. Each printer definition creates a driver file, which can be exported and distributed to other users. The driver can be customized to fit the specific DICOM printer in the department.



To Define a DICOM Printer

1. Click on **Settings** on the toolbar.
2. Click the **DICOM Printer** tab in the Settings dialog box.

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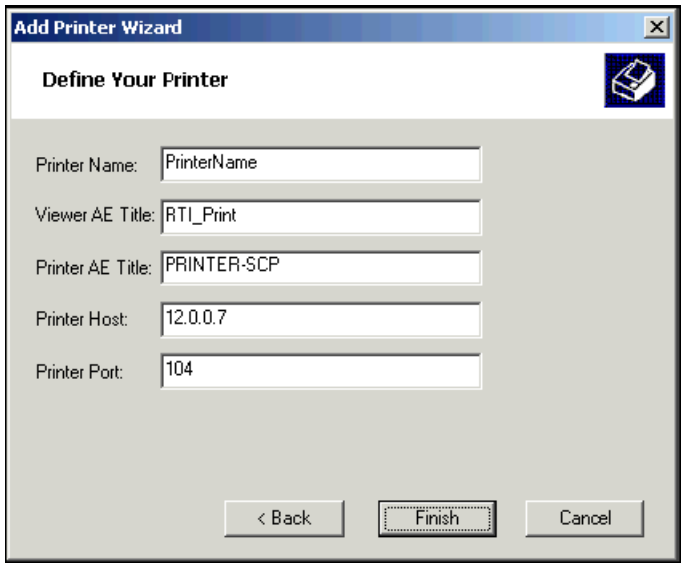
3. Click **New** to open the Add Printer wizard.



4. Fill in the following fields:
   - **Printer Name**—Any name that fits your department
   - **Viewer AE Title**—The DICOM Application Entity Title, usually not changed
   - **Printer AE Title**—The DICOM Application Entity Title of the DICOM printer, as provided by the system administrator
   - **Printer Host** (IP Address)—As provided by the system administrator
   - **Printer Port**—As provided by the system administrator
5. Click **Finish** to complete the Wizard.
6. The newly defined DICOM Printer will appear in the drop down list.

iPACS Viewer creates a printer driver file (.dpr) with the above values. This file can be created once for the local DICOM Printer; exported and distributed to other users.

To Import a DICOM Printer Driver:

1. Click **Import**.
2. Browse to the location of the printer driver (.dpr) file.
3. Click **Open** to import the printer definition to the local computer.

To Export a DICOM Printer Driver:

1. Click **Export**.

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2. Click **Save** to save the printer definition as a driver file (.dpr).

To Ensure that the DICOM Printer Has Been Defined Properly and is Working

1. Click **Echo**.
2. The iPACS Viewer will send a DICOM C-ECHO to the printer.
3. The result of the DICOM C-ECHO will appear in a message box.
4. If the DICOM C-ECHO was unsuccessful, check your printer settings and try again.

To Edit the DICOM Printer Settings

1. Select a DICOM Printer from the drop down list box.
2. Click **Edit** .
3. The printer Info dialog box opens and you can edit the DICOM Printer settings here.

To Delete a DICOM Printer Setting

1. Select a DICOM Printer from the drop down list box.
2. Click on Delete .
3. Confirm the deletion of the DICOM Printer.

To Change Specific Settings in the DICOM Printer's Definition:

1. Click **Advanced** in the DICOM Printer tab of the Settings dialog.
2. The Advanced Settings dialog box opens for that printer.
3. Add a new attribute by selecting its category and then clicking on **New Attribute** .
4. Delete an attribute by selecting it and then clicking on Delete Attribute .
5. Revert back to all defaults by clicking on the **Restore Defaults** button.

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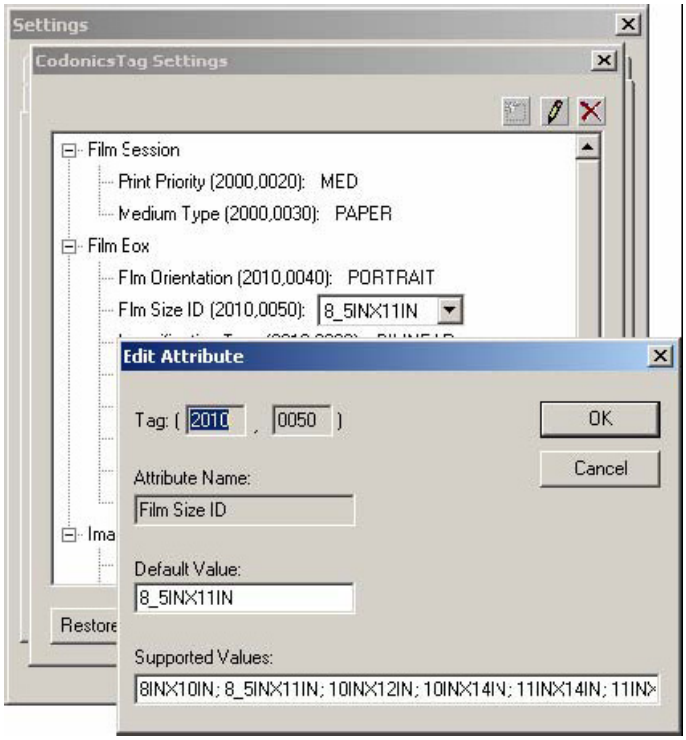
To Change a Printer Property

Select a property and click on Edit . Those properties defined as Automatic, will automatically chose the appropriate value among those defined for it.



The properties of the DICOM printer can be set as follows:

- Film Session
  - Print Priority (2000,0020): HIGH, MED, or LOW
  - Medium Type (2000,0030): PAPER, CLEAR FILM, or BLUE FILM
- Film Box
  - Film Orientation (2010,0040): PORTRAIT or LANDSCAPE
  - Film Size ID (2010,0050): Various film sizes, default 8_5INX11IN
  - Magnification Type (2010,0060): REPLICATE, BILINEAR, CUBIC, or NONE
  - Border Density (2010,0100): BLACK or WHITE
  - Empty Image Density (2010,0110): BLACK or WHITE
  - Min Density (2010,0120): 0
  - Max Density (2010,0130): 300
  - Trim (2010,0140): YES or NO

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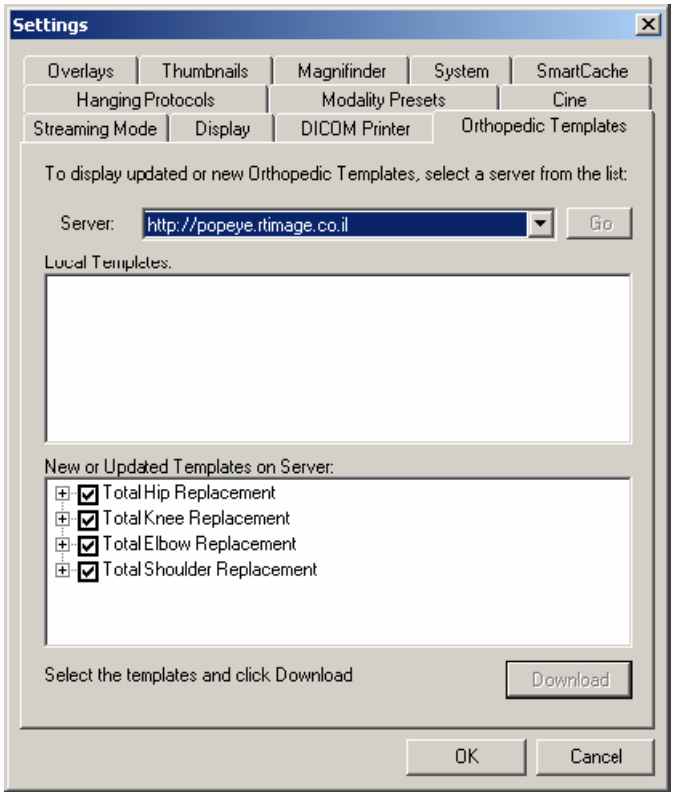
- Image Box
  - Polarity (2020,0020): NORMAL or REVERSE
  - Bits Allocated (0028,0100): Automatic
  - Bits Stored (0028,0101): Automatic
  - High Bit (0028,0102): Automatic
  - Pixel Representation (0028,0103): Automatic

Do not change any parameter without specific instructions from your system administrator or printer technician. Changes in the DICOM printer parameters can cause the print function to stop working. In case of malfunction, restore the default settings and try again.

Orthopedic Template Settings (Optional)

If the iPACS server is installed with the appropriate license for the Ortho Module and you have Ortho Permissions, you can download Orthopedic Templates of different manufacturers to use in the Viewer.



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To Download the Ortho Templates:

1. Select a server from the list.
2. Click **Go**.
3. A list of all available templates will be displayed.
4. Templates are sorted according to Procedure and Manufacturer.
5. Check the box next to an individual template or a family of templates.
6. Click **Download** to begin downloading the Ortho Templates to your computer.
7. The Downloading Orthopedic Templates dialog box opens with the amount of templates chosen for download and their progress.
8. After downloading is complete, you can use the downloaded templates for Ortho Templating.

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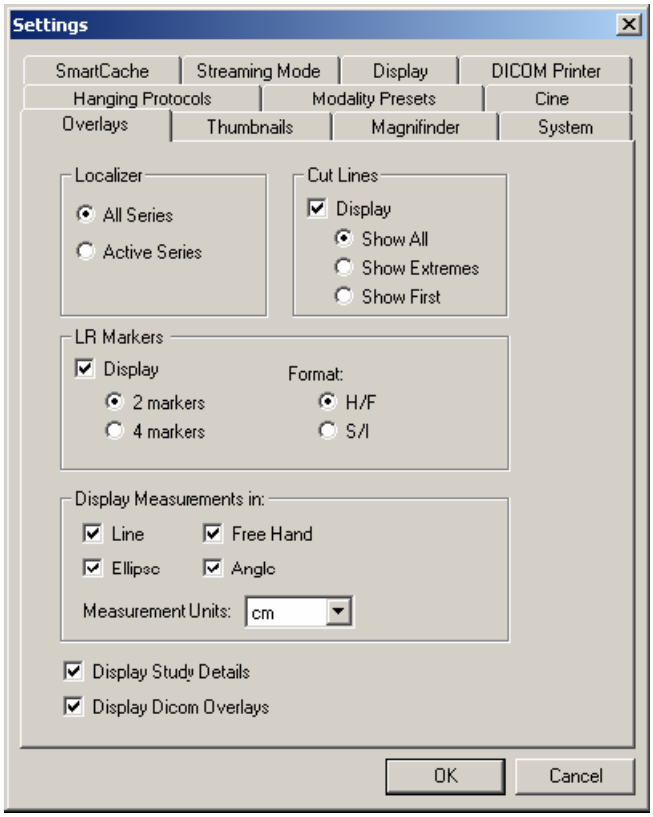
Overlay Settings

In the Overlays Tab, you can set all the overlay options of the images. The options include displaying Localizer, Cut Lines, LR Markers, Measurements, Study Details, and DICOM Overlays.



Localizer

You can display the slice indicators on the localizer as follows:

- **All Series**—All slices indicators of all series of the study appear on the localizer image in different colors. (Default)
- **Active Series**—Only the slice indicators of the active series appear on the localizer image.

Cut Lines

Cut lines have four possible states:

- **Display**—Display all cut lines. If unselected, hide all cut lines.
- **Show All**—Show all cut lines corresponding to all displayed slices in the active series. (Default)

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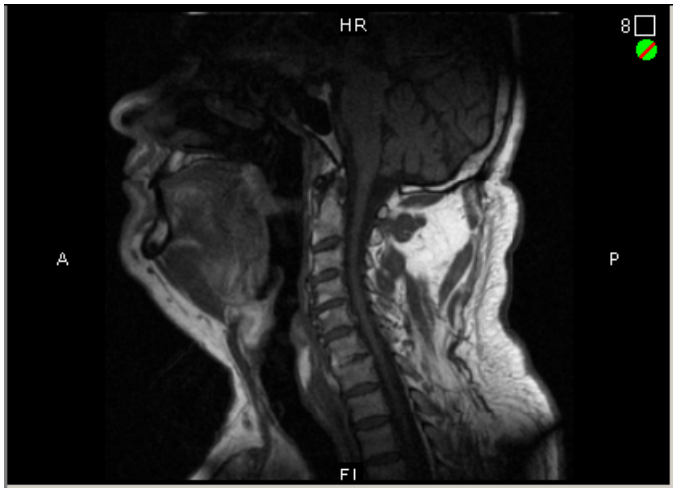
- **Show Extremes**—Show only the first and last cut lines of the displayed slices in the active series.
- **Show First**—Show only the first cut line of the displayed slices in the active series.

LR Markers

Left Right markers are indicated on the image in order to help in orientation of the image. The following can be used:

- **H**—Head
- **F**—Feet
- **S**—Superior
- **I**—Inferior
- **A**—Anterior
- **P**—Posterior
- **R**—Right
- **L**—Left



You can display the LR markers as follows:

- **Display**—Display all LR markers. If unselected, hide all LR markers.
- **2 markers**—Display right and bottom markers only. (Default)
- **4 markers**—Display all four markers.

You can set the format of the LR markers as follows:

- **H/F**—Use Head/Feet annotation (Default)
- **S/I**—Use Superior/Inferior annotation

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Display Measurements

Display measurements on the image next to the following annotations:

- Line
- Ellipse
- Free Hand
- Angle

If the option is unchecked, the measurement will not be displayed by default next to the annotation. You can display an individual measurement by using the right click menu on the specific annotation.

Measurement Units

Set the unit of measure to be displayed when using the measurement tools. You can display measurement in:

- mm
- cm (Default)
- inches
- pixels

If the Pixel Spacing tag does not exist in the DICOM Header, the measurement unit will be displayed in pixels.

Display Study Details

Displays or hides the overlay annotations on the study. These study details include patient information, study information, slice number, and windowing level.

Display DICOM Overlays

Displays or hides the DICOM overlay on the study. These study details include text, Free Hand, ellipse, pixel intensity, and arrow annotations. They can come from the original study, as received by iPACS, or as saved by the iPACS users.

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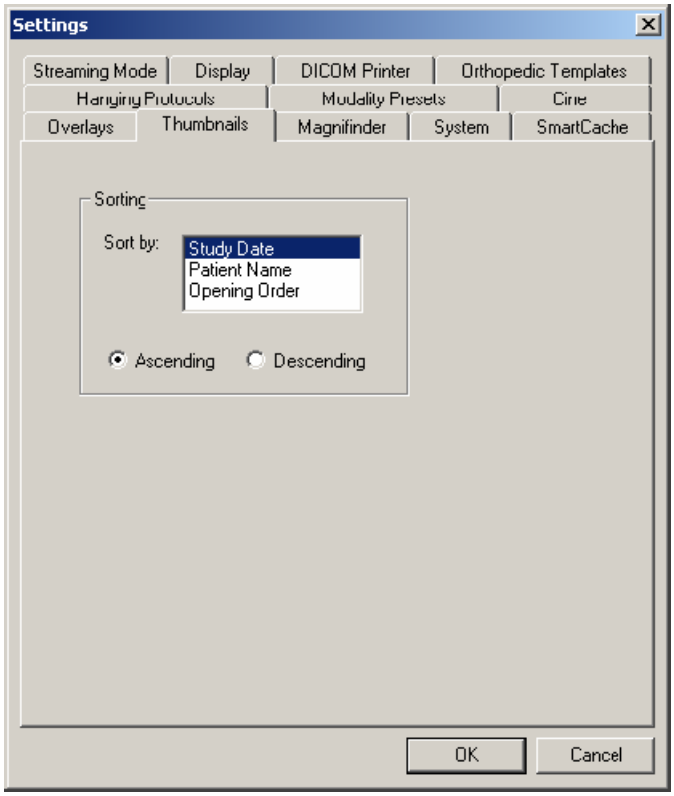
Thumbnail Settings

In the iPACS Viewer, you can configure the Thumbnails to display according to your personal preferences. When opening several studies in iPACS, the thumbnail images in the preview pane can be sorted, ascending or descending, by:

- Study Date
- Patient Name
- Opening Order



For iPACS Cardio, there is an additional ability to display small or large thumbnails of the series. If Large Thumbnails is selected and a series is opened, you can choose to display the:

- First Image
- Middle Image
- Last Image

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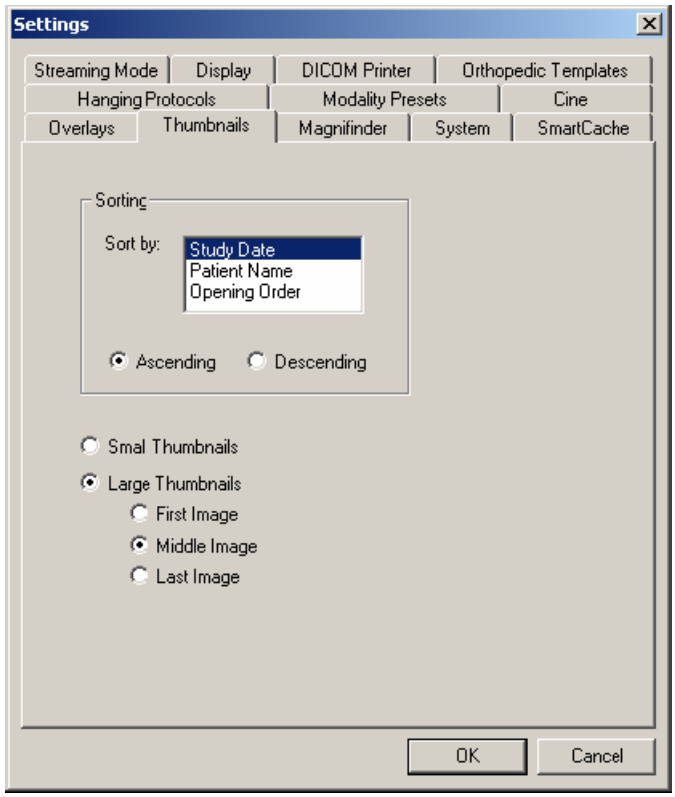

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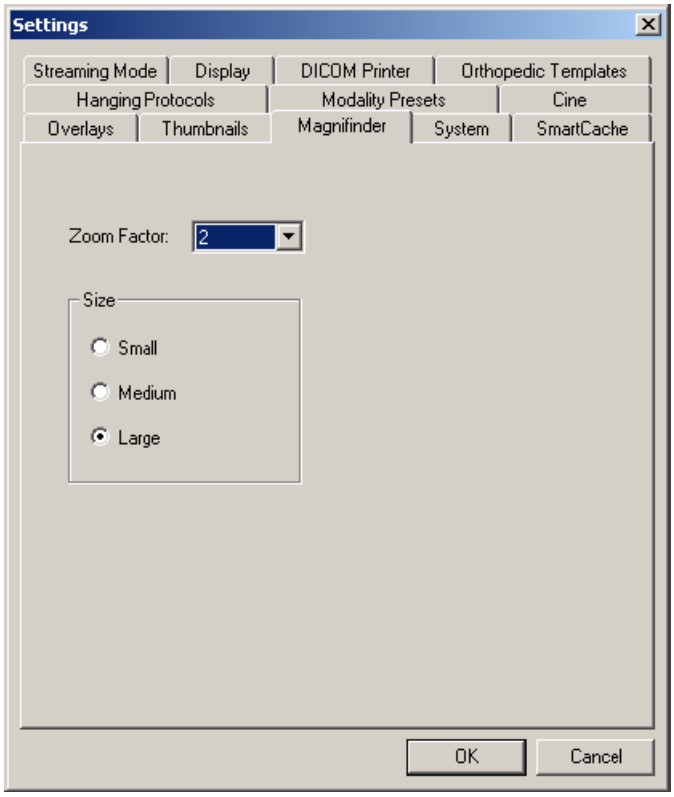
Magnifinder Settings

In the Magnifinder tab, you can define the zoom factor and size of the magnifying square.



The following can be selected:

- Zoom Factor:
  - 2 (Default)
  - 4
  - 8
  - 16
- Size:
  - Small
  - Medium
  - Large (Default)

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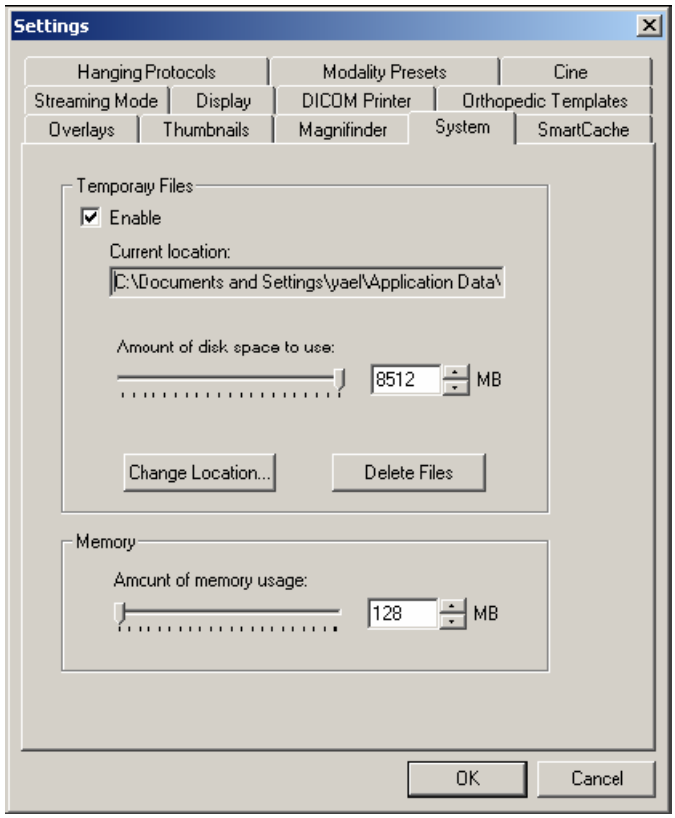
System Settings

Temporary files are stored on your local computer and help you view studies faster the next time you open them. Once you have viewed a study with the iPACS Viewer, you may want to view it again at a later date. If your temporary files is enabled, you will be able to view the previously viewed study immediately and locally without streaming.

For example, you viewed a series in 1:2 resolution and then closed the iPACS Viewer. The next time you open the same series, all information that was received previously will be available locally on your computer. All data already received, up to 1:2 resolution, will be immediately available. Any information beyond that resolution will arrive by streaming.



In the Temporary Files tab, you can define the location of the Viewer temporary files, and the amount of disk space to use. Set the high limit of disk space to use. When the temporary directory reaches the high limit, it will delete the Least Recently Used (LRU) files until it reaches a certain percentage of the high limit (usually 30%).

The following are displayed:

- Enable—If checked, allows temporary files to be stored on your local computer. If disabled, all temporary files currently

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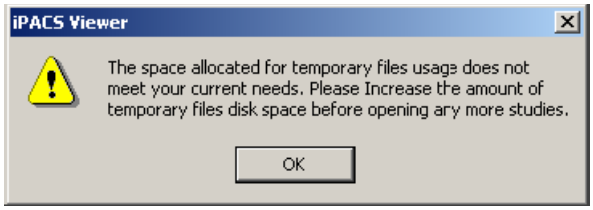
stored on your computer will be deleted and no temporary files will be saved in the future.

- **Current Location**—Displays the exact location on the computer where the Viewer temporary files will be stored. (Usually …C:\Documents and Settings\<username>\Application Data\iPACS Viewer\Viewer temporary files.)
- **Amount of disk space to use**—Sets the physical amount of disk space to use for the temporary files. During the installation, it is set to half of the amount of the free disk space available of the local drive (as indicated in the current location).

If disk space has reached its limit, you cannot open a new study unless they clear the temporary files, or increase the amount of disk space to use.

The following message appears when the disk space has reached its limit:



- **Change Location**—Click on this button to change the location of the temporary files. After changing file location, all temporary files will be deleted and all open studies will be closed. New files will be saved in the new location.
- **Delete Files**—Click on this button in order to delete the Viewer temporary files currently on your computer. Delete Files will not remove files of studies currently open.
- **Memory**—Set the amount of memory used by iPACS Viewer. Memory changes will be applied only after the iPACS Viewer is restarted.

SmartCache Settings

iPACS Viewer uses Pixels-On-Demand™ technology to stream the study data to your workstation. SmartCache streams additional study data while you are viewing an image. This allows for the best possible efficiency in your workflow.

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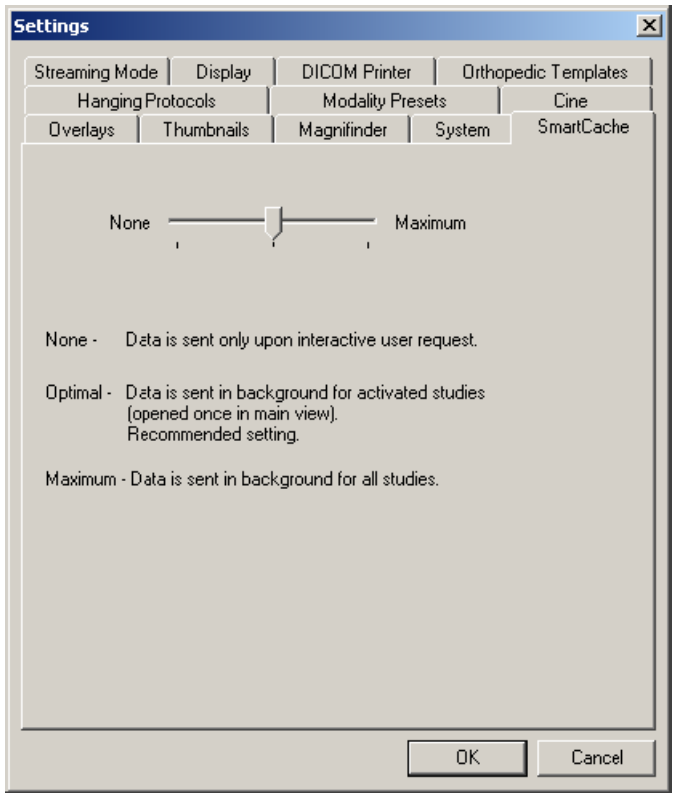
SmartCache allows you to set the level of automatic data transfer to the Viewer, in idle time. SmartCache brings all the data of the studies open in the preview pane to your workstation, even the series that are not currently selected for viewing.



There are three levels of SmartCache:

1. **None**—Data is sent to the workstation only upon interactive user request.
2. **Optimal**—Data is sent in the background for activated studies. (An Active study is a study that has been opened at least once in the main view.) This is the recommended setting.
3. **Maximum**—Data is sent in background for all studies, even if they are only opened in the preview pane.

SmartCache streams data only during idle time, thus it will not disturb the normal usage of the Viewer.

Server performance can be reduced if SmartCache is set to maximum. Only those users for whom on-demand streaming is not appropriate for their workflow should use SmartCache Maximum. SmartCache Optimal is the default for all users.

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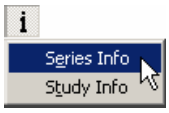
Image Information

Patient, Series, and Study Information

Opens the info dialog box that contains Patient, Study, and Series Information for the active image/series. This information is retrieved from the image DICOM header.



The info button appears both on the toolbar, where you can choose to display Study or Series info for the currently active image. On the top bar of each image or series, same button is used for Study Info.

The Study Info displays the Patient and Study Information, while the Series Info displays the Patient and Series Information.

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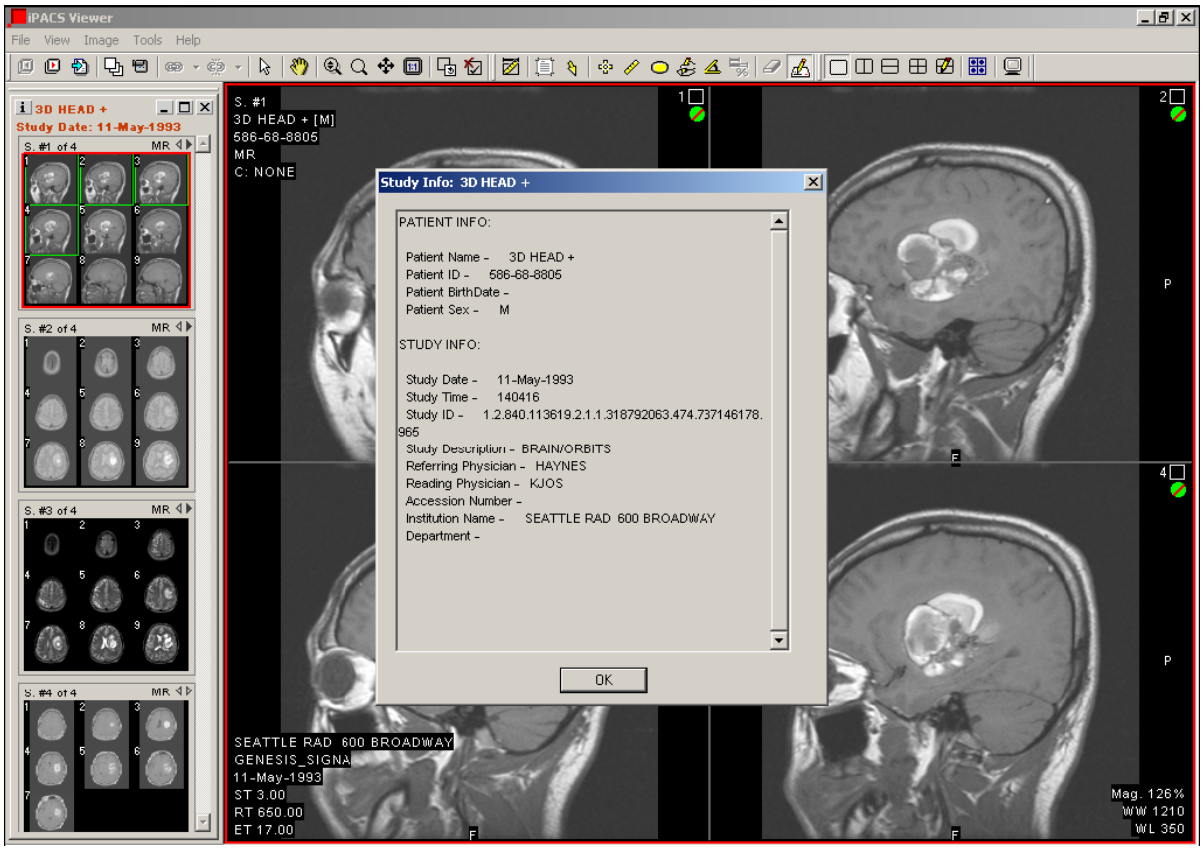

Clicking on the **Study Info** button opens a separate window with the following data:

Patient Information:

- Patient Name
- Patient ID
- Patient Birth Date
- Patient Sex

Study Information:

- Study Date
- Study Time
- Study ID
- Study Description
- Referring Physician
- Reading Physician
- Accession Number

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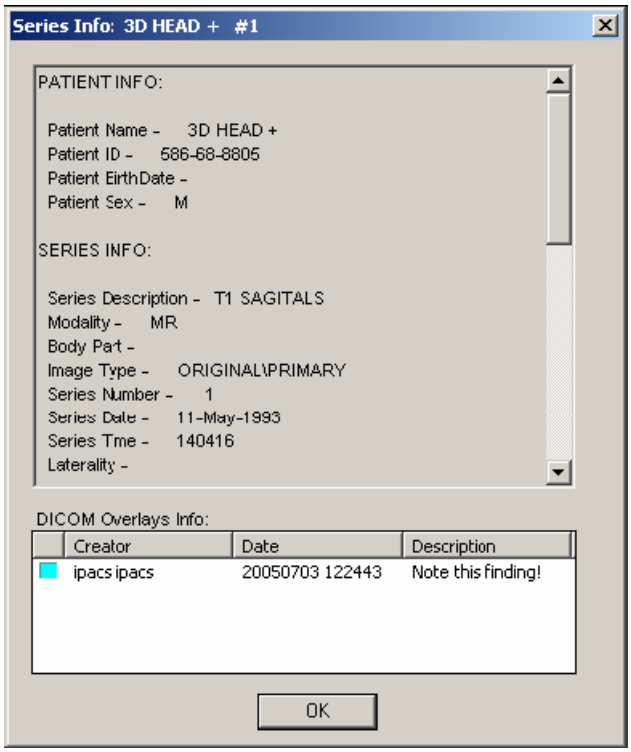
- Institution Name
- Department



Clicking on the **Series Info** button in the main view opens a separate window with the following data:

Patient Information:

- Patient Name
- Patient ID
- Patient Birth Date
- Patient Sex

Series Information:

- Series Description
- Modality
- Body Part
- Image Type
- Series Number
- Series Date
- Series Time

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- Laterality
- Protocol Name
- Manufacturer
- Model Name
- Station Name
- Contrast/Bolus Agent
- Rows
- Columns
- Bits Allocated
- Bits Stored
- Window Width
- Window Center
- Pixel Spacing

For CR:

- Plate Type
- Phosphor Type
- Cassette Orientation
- Cassette Size
- Sensitivity

For MR:

- Scanning Sequence
- Repetition Time
- Echo Time
- Echo Train Length
- Inversion Time
- Trigger Time
- Magnetic Field Strength
- Sequence Variant

For CT:

- KVP (Kilovolt Peak in mA)
- Gantry/Detector Tilt
- Table Height
- Exposure (in mA)
- Filter Type
- Rotation Direction

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For NM:

- Actual Frame Duration
- Counts Accumulated
- Scan Length
- Scan Velocity
- Table Height
- Table Transverse
- Whole Body Technique

For XA:

- Angle of Acquisition
  - Primary Angle—LAO (>=0°) or RAO (<0°)
  - Secondary Angle—CRAN (>=0°) or CAUD (<0°)

If the study contains DICOM Overlays, the following is listed for each overlay:

- Color
- Creator
- Date
- Description

Overlays

Overlays are displayed on the image, according to the modality and the defaults set in the settings dialog box.

- **Overlay Off**—Hide all displayed overlays, including Cut Lines, Localizer, LR Markers, DICOM Overlays, and Study Details.
- **Overlay On**—Show overlays according to the defaults set in the Settings dialog box.

Overlays Annotations include:

- Cut Lines
- Localizer Slice Indicators
- LR Markers
- DICOM Overlays
- Study details:

Top Left corner:

- Series Number

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- Patient Name and Sex
- Patient ID
- Patient Birth Date
- Accession Number
- Modality
- C—Contrast—If no contrast was used, NONE is written. If contrast was used, the name of the contrast is written.

Bottom Left corner:

- Institution Name
- Manufacturer Model
- Study Date
- ST—Slice Thickness
- KVP (For CT)
- RT—Repetition Time (For MR)
- ET—Echo Time (For MR)
- IT—Inversion Time (For MR)

Top Right corner:

- Slice number

Bottom Right corner:

- Linked Group (if image is linked)
- Calibrated (if calibration is done)
- Magnification
- WW
- WL

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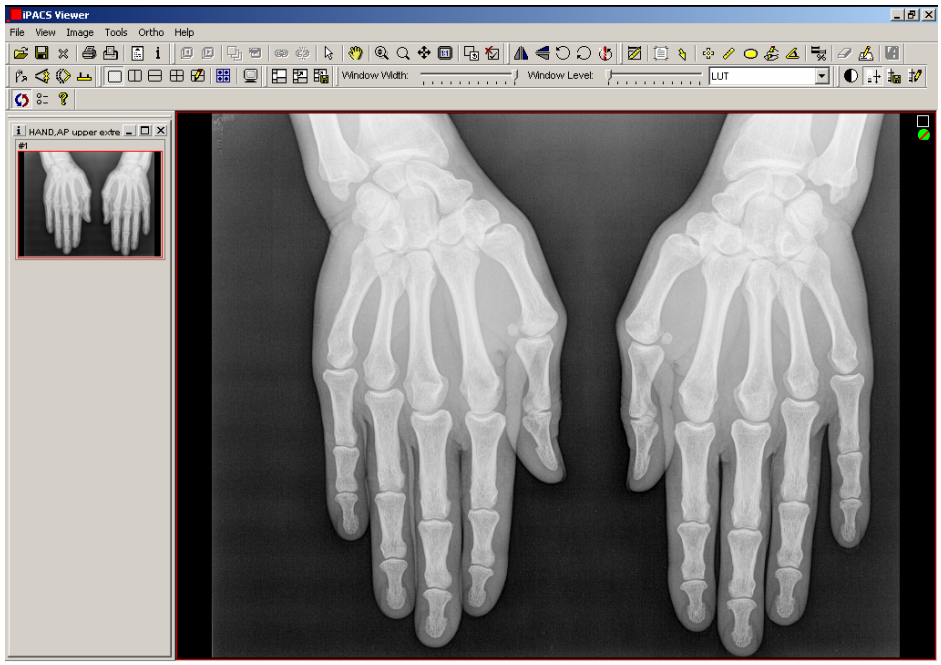
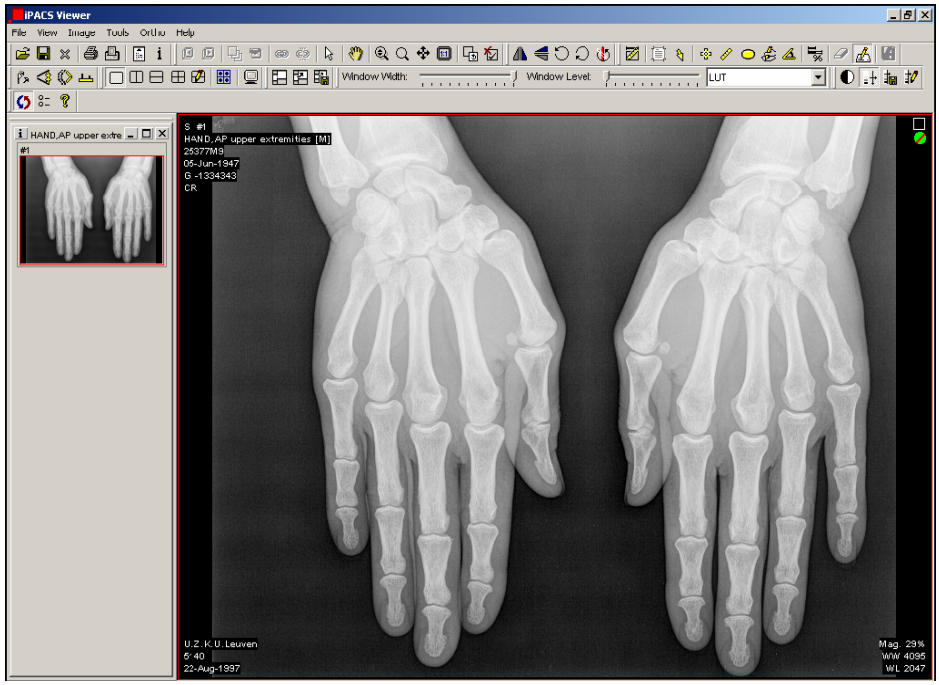
Overlays can be toggled on and off, using the Overlay Annotations button.



Overlay Off



Overlay On

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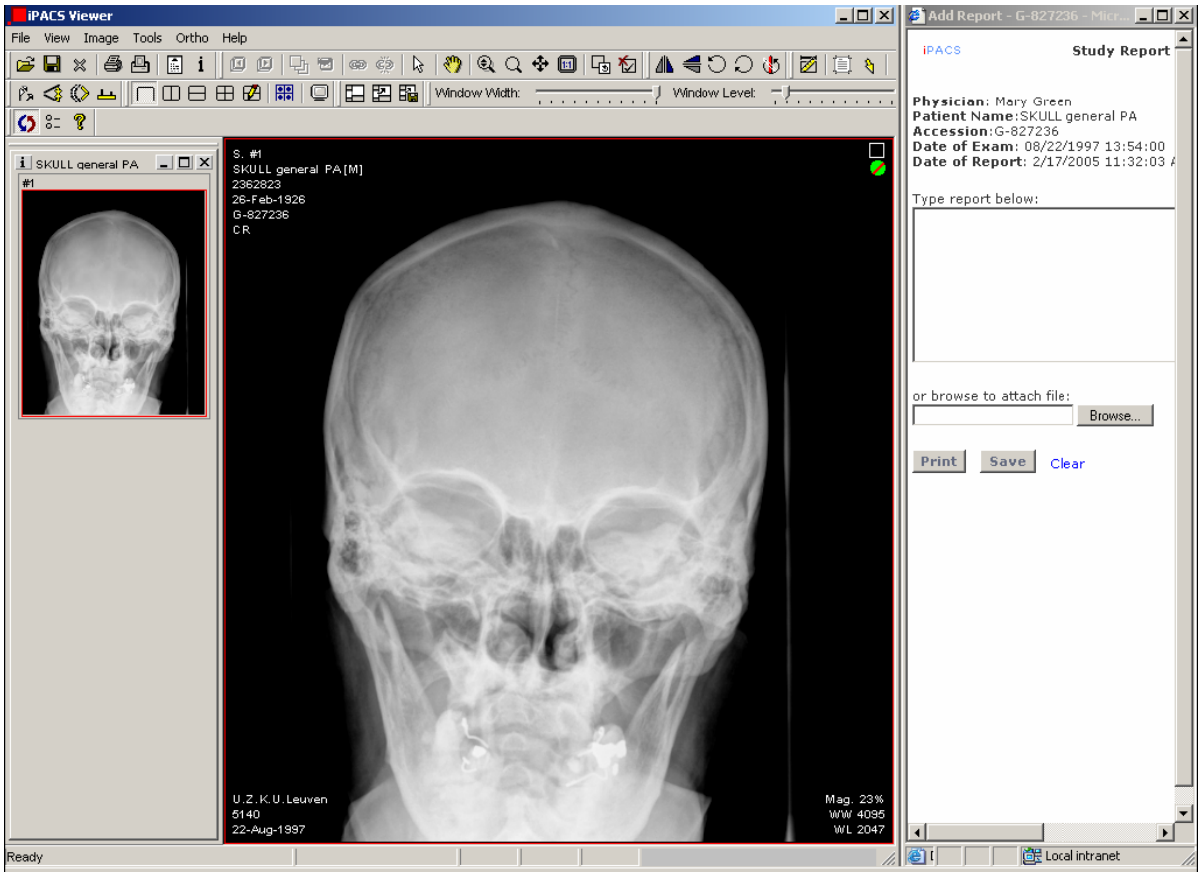
Study Report

Click on Study Report in the toolbar, in order to open the Add Report window for the active study.

In some cases of integration, this option is disabled.

The Add Report window opens in the right hand side of the screen, next to the Viewer. In the report window, you can view previously written reports and add new reports.



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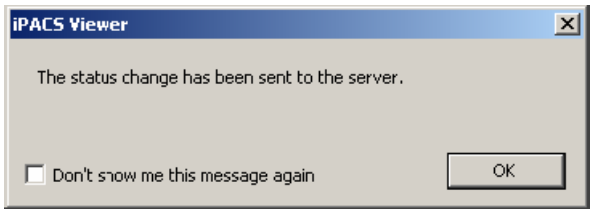
Set Next Status

Sets the next study status on the server for the study currently in the active view of the Viewer. The default statuses of the study can be Unread, Viewed, Read. The Set Next Status button changes the status from Unread to Viewed, and from Viewed to Read. After clicking on Set Next Status, you get the following message:



In some cases of integration, this option is disabled. The names used for the study's statuses are configurable by the system administrator and may vary.

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Pop Up Menu

Right clicking on the image in the main view opens a pop up menu that contains the following functions:

Zoom

- Zoom In
- Zoom Out
- Fit To Screen
- 1:1 Resolution
- Zoom Tool
- Magnifinder

Pan

Window

- Manual
- Preset—According to the values in the Settings dialog box.
- Default
- Default 2
- LUT
- Edit
- Save Current
- Invert Color

Flip/Rotate

- Flip Horizontal
- Flip Vertical
- Rotate 90 Left
- Rotate 90 Right
- Reset Orientation

Restore Image

Series Layout

- 1 x 1
- 1 x 2
- 2 x 2
- 2 x 3
- 3 x 3
- 4 x 4

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- Custom…

Cine

Full Screen (or Return to Main View)

Display/Hide Overlays

Measurements

- Text
- Free Hand
- Line
- Angle
- Ellipse
- Pixel Intensity
- Arrow
- Cardio Thoracic
- Delete All

Calibration

Save

- Save images on local disk
- Save Annotations on Server
- Save Snapshot on Server

Copy to Clipboard

Orthopedic Tools (optional)

- Angle between two lines
- Cobb Angle
- Transischial Line
- Templating

Close

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Printing an Image

Print

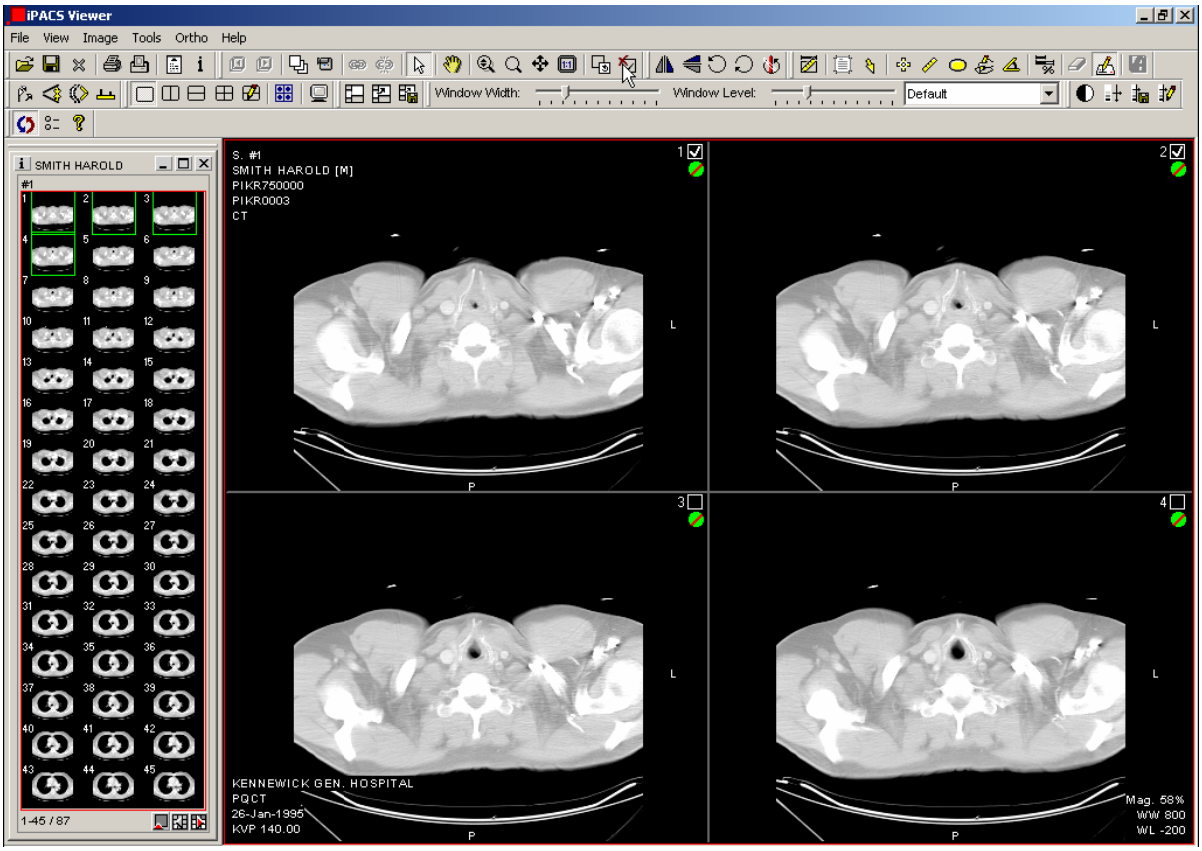
Prints the selected image from the main view using a Windows printer.

DICOM Print (optional)

Prints the selected images from the main view using a DICOM printer.

To Customize DICOM Print

1. Define a DICOM Printer in the Settings dialog box.
2. To select images in the main view, click in the box (upper right hand corner). A check mark appears.



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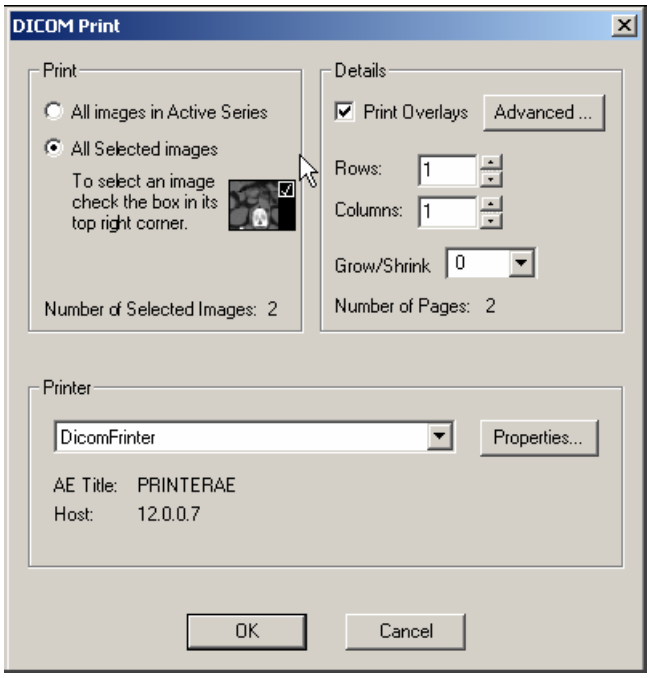
3. Click on DICOM Print to open the DICOM Print dialog box.



4. Select to Print:
   - All images in Active Series (Images need not be specifically selected.)
   - All Selected images (Images can be from several studies)
5. The Number of Selected Images in the main view is indicated.
6. Select/Unselect to Print Overlays.
7. Set the number of Rows and Columns desired in the printed page. For example, choosing two rows and two columns will result in a 2x2 layout, or four images printed per page.
8. Select Grow/Shrink font according to the DICOM Printer.
9. The resulting Number of Pages is displayed.
10. Select which DICOM Printer will be used for this print job from the drop down listbox.
11. Click **OK** to send the images to the printer.
12. The Printing Status icon will appear in the lower right hand corner of the iPACS Viewer.

To Cancel a DICOM Print Job in Progress:

1. Double click on the **Printing Status** icon

.

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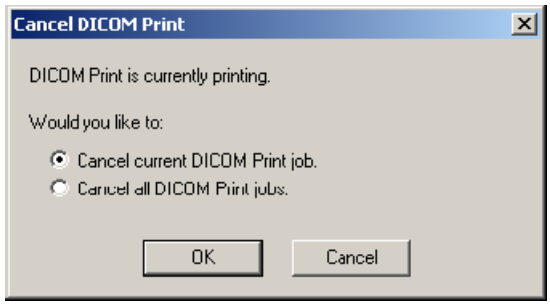
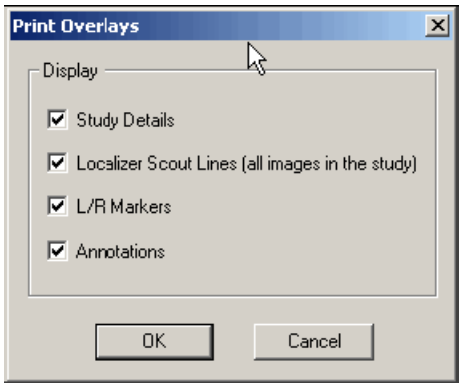
2. The Cancel DICOM Print dialog opens.



3. You can cancel the current DICOM Print job or all DICOM Print jobs.

To Set Advanced DICOM Print Settings

1. Select to print with or without Print Overlays on the image.
2. Click on the Advanced button to open the Print Overlays dialog box.
3. Select to print with Study Details, Localizer Scout Lines, L/R Markers, or Annotations.



To Set the Printer Properties

1. Click on **Properties** next to the printer name.
2. The Properties dialog opens.
3. You can change the following:
   - Film size
   - Medium Type
   - Film Orientation
   - Border Density
   - Empty Image Density
   - Polarity

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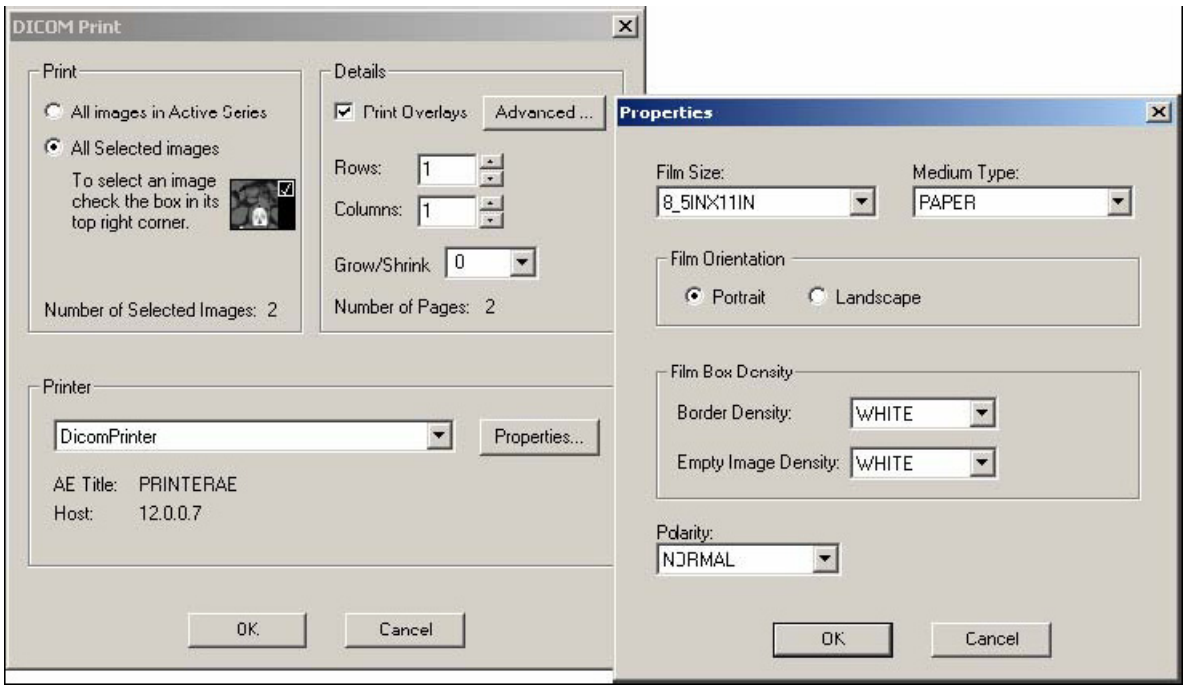
4. These changes are reflected in the Advanced Printer settings in the Settings dialog box.



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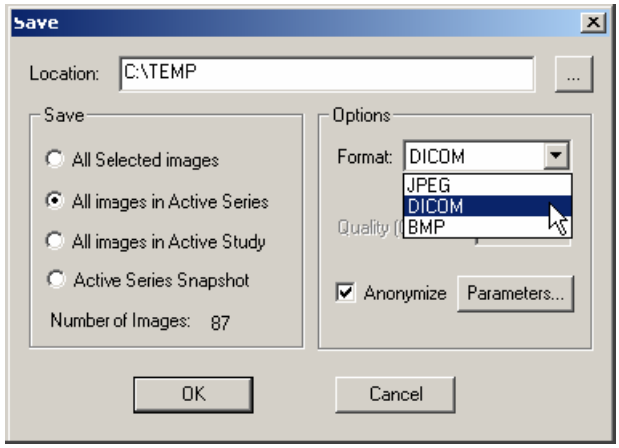
Saving an Image

The Save button allows you to save images in one of the following ways:

- Save images on local disk
- Save Annotations on Server
- Save Snapshot on Server

Save Images on Local Disk

Saves images from the main view to a local file in various formats.



To Save an Image:

1. Select a location where to save the images.
2. Select one of the following:
   - **All Selected images**—only checked images are saved
   - **All images in Active Series**—all images in active series are saved
   - **All images in Active Study**—all images in active study are saved
   - **Active Series Snapshot**—screenshot taken of active series window, snapshot shown with annotations, current windowing and image manipulation
3. Select one of the following formats:
   - **JPEG**—saves without annotations
   - **DICOM**—with DICOM header from original file
   - **BMP**—saves without annotations

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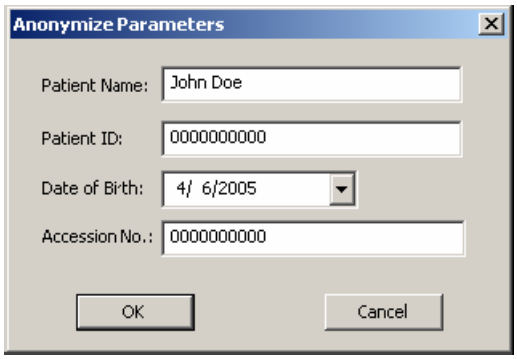
4. If you choose JPEG format, you can set the quality of the saved jpeg image from 0 to 100%. Higher quality means a larger file size. Lower quality means a smaller file size.
5. **Anonymize**—If you choose DICOM format, you can anonymize the study by clicking the Parameters button. There you can enter an anonymous Patient Name, Patient ID, Date of Birth, and Accession Number.



Save as DICOM—If the original file is a multi-framed image, the file is saved like the original, as one large DICOM file.

Save Annotations on Server

Saves the text and measurement annotations that were written on the image. These annotations become DICOM Overlays on the server.

After save, other users will be able to see the DICOM Overlays on the images. You can save the annotations for all series opened in the main view or just the active series (indicated by a red frame around the image window.) You can add a description describing your annotations.

Once annotations are saved, they become DICOM Overlays, their color changes and they can no longer be edited or deleted.

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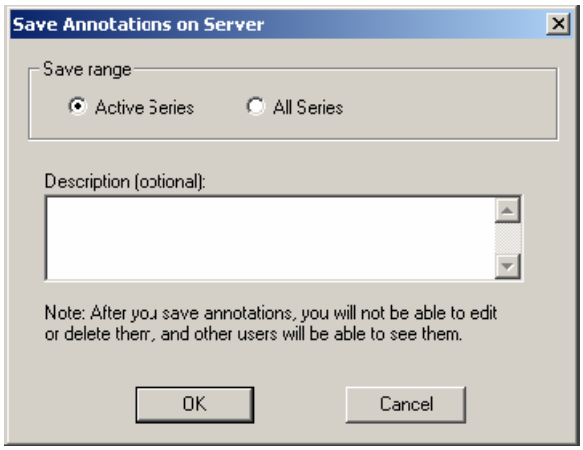

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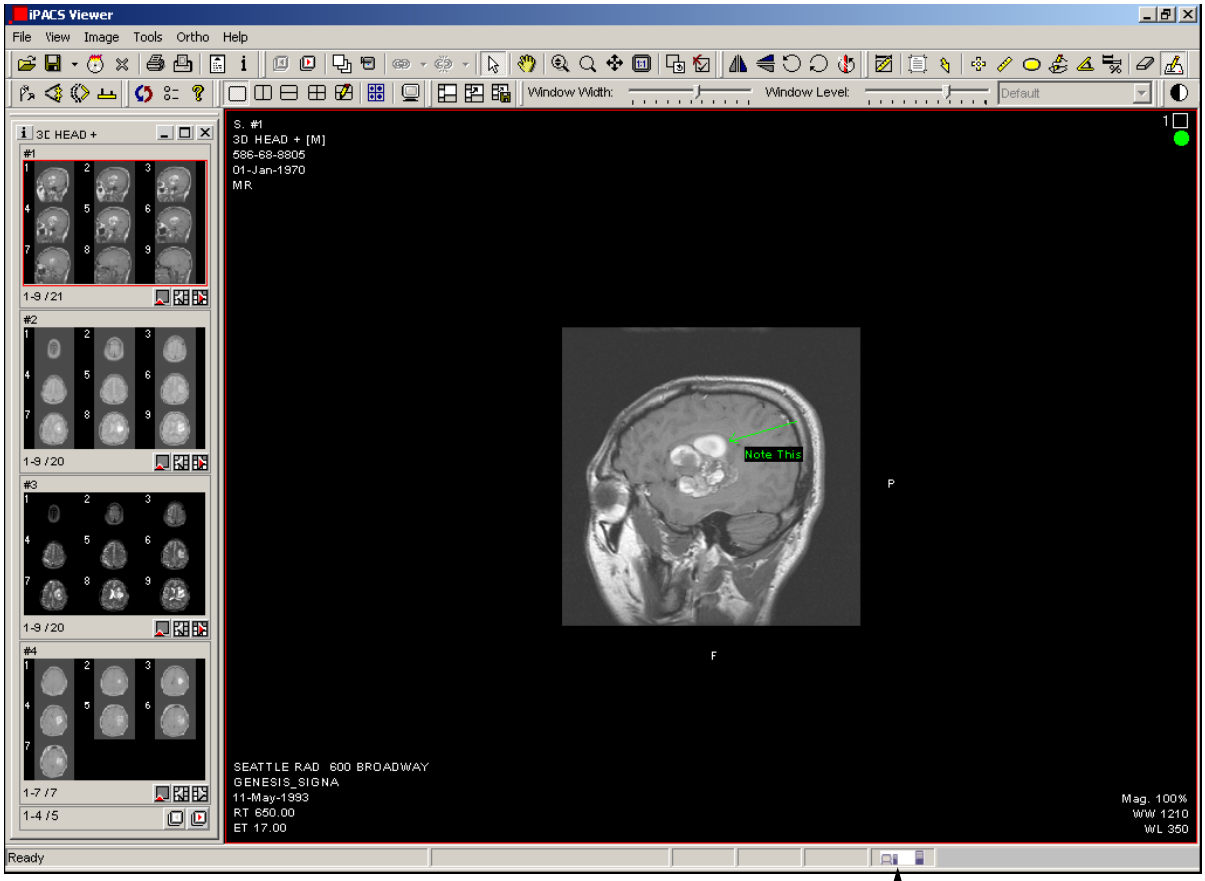
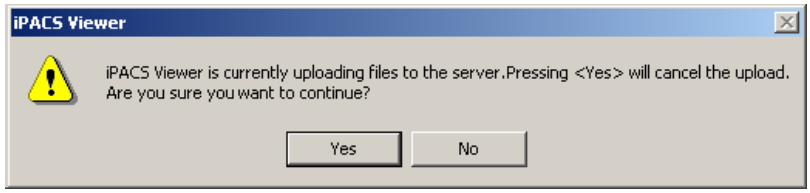
Save Snapshot on Server (Secondary Capture)

Saves the active view as a DICOM Secondary Capture (SC) and sends this image to the server. The snapshot includes the images currently displayed on the active view, including all the images (for series layout more than 1x1), the measurements and annotations.



Display showing that image is being sent to the server

While saving, an animated gif appears in the status bar of the viewer to show that images are being sent to the server. To cancel the save task, double click on the gif on the status bar.



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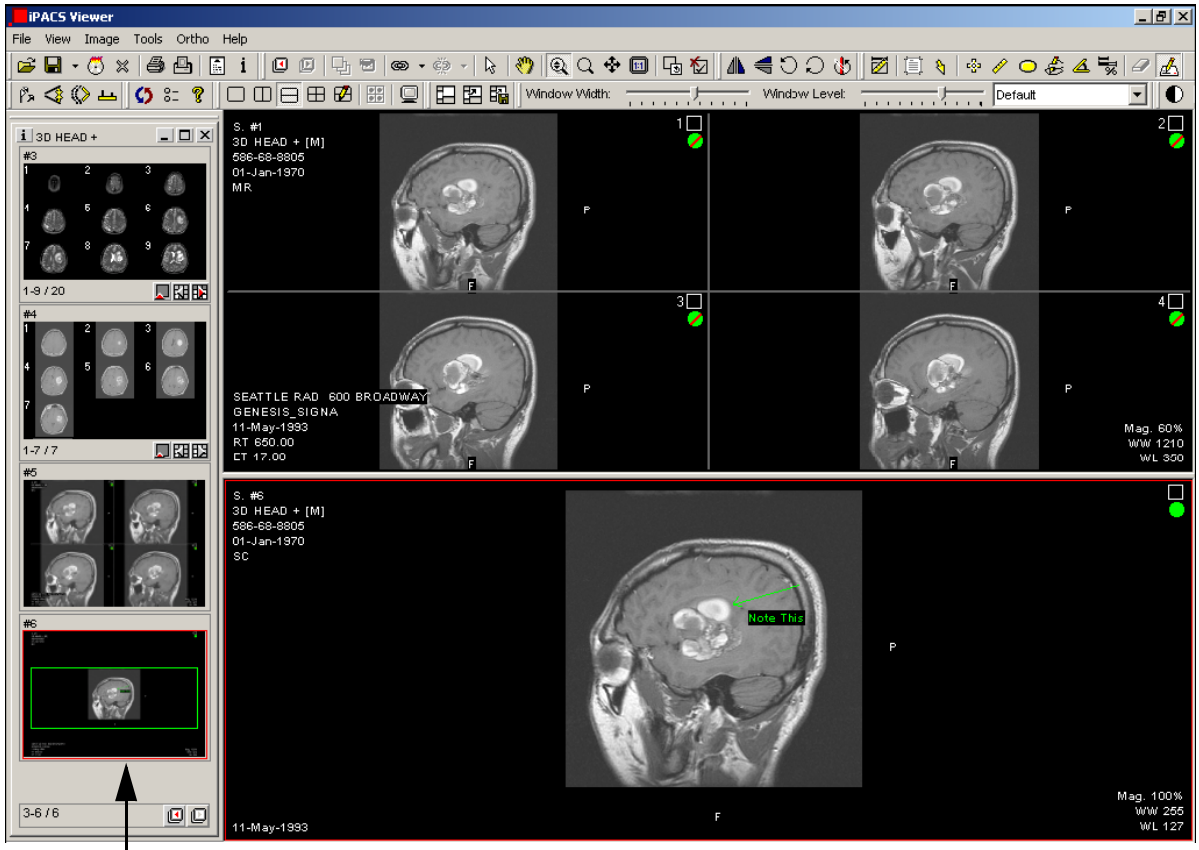
When saving is complete, the viewer will display a message saying *A new secondary capture image is being added to this study. To view this image, you can close and re-open the updated study. Note: there may be a short delay before the new image can be viewed.*



Each secondary capture created as a new DICOM series

Each SC is created as a new DICOM series with same StudyUID as the original study. Next time you open the study, a new series defined as SC is added to the study.

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Creating a CD/DVD (optional)

Burns selected study, images, and reports on a CD/DVD for distribution.

There are two stages of the CD Burn:

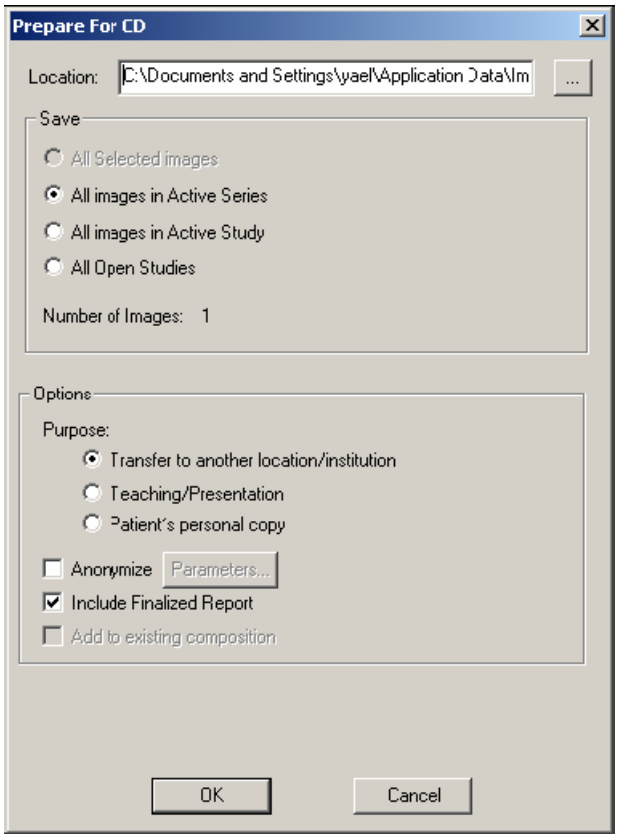
- Compose the CD directory for burning—selecting images or studies, along with their reports. You can also choose to anonymize the patient information before burning.
- Do the actual burn on the CD

How to Burn to a Single Disk

Please review User Limitations for Burning CD/DVD on page 144 before attempting to burn/create a CD/DVD.

To Burn a Single CD/DVD

1. Click on the **CD Burn** button .
2. The Prepare for CD window opens.



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3. In the **Location** field, choose a location for the CD contents.
4. In the **Save** panel, select one of the following:
   - **All Selected images**
   - **All images in Active Series**
   - **All images in Active Study**
   - **All open studies**
5. In the **Purpose** field, select one of the following:
   - **Transfer to another location/institution**
   - **Teaching /Presentation**—Selecting this option automatically anonymizes the study.
   - **Patient's personal copy**
6. Select **Anonymize** to remove identifying patient information from the burned images. Click the **Parameters** button to select the following study parameters to anonymize:
   - **Patient Name**
   - **Patient ID**
   - **Date of Birth**
   - **Accession Number**

- The **Anonymize** field is only automatically selected by default when the **Teaching/ Presentation** purpose is selected. For any other purpose, the user must manually select this option.
- Regardless of this setting, reports are not anonymized

7. Select **Include Finalized Report** to include the study's reports on the CD/DVD.

Reports are not anonymized.

8. Click **OK**.
9. The CD Burner application opens. Use the **Add** or **Remove** buttons to add/remove studies or reports for burning.

The size of the composition is shown in the status bar in the lower right hand corner.

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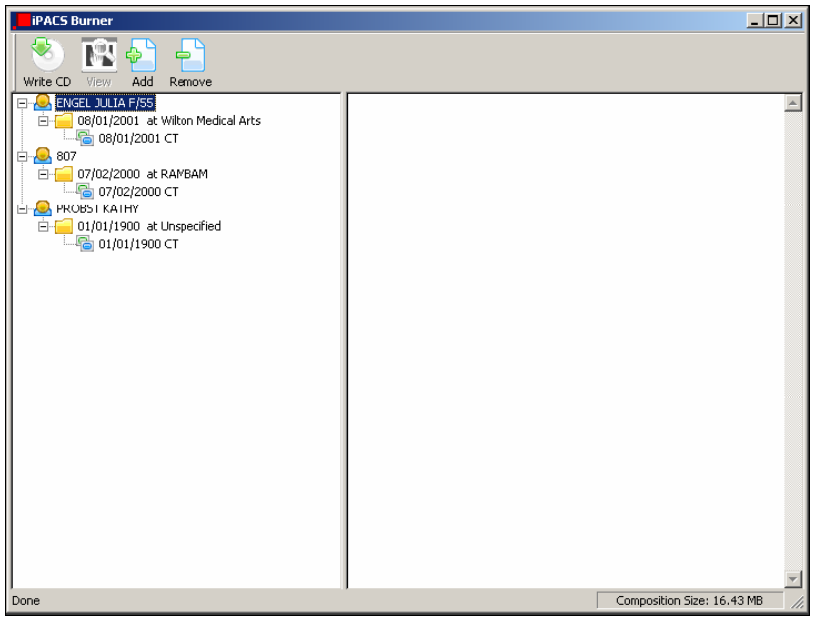
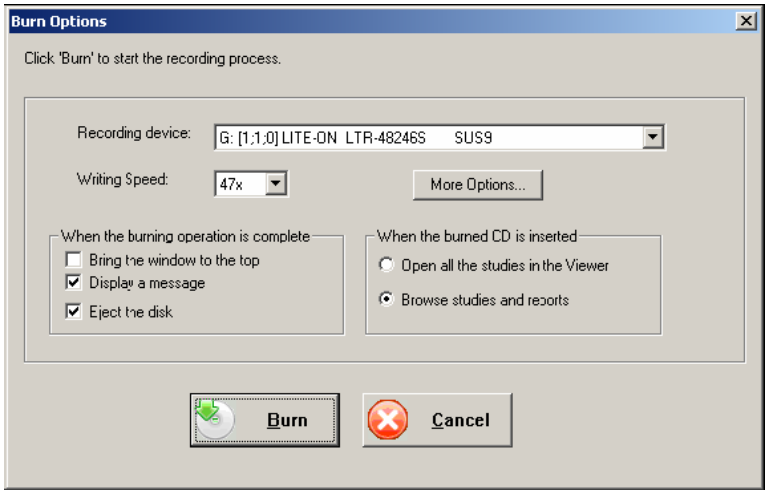


10. Click **Write CD** to open the iPACS Burner window.



11. In the **Recording Device** field, select the device to burn images to.
12. In the **Writing Speed** field, select the writing speed.
13. Click **More Options** to display the Burning: More Options window.
14. In the **API to use** field, select one of the following:
    - **Internal API (Recommended)**

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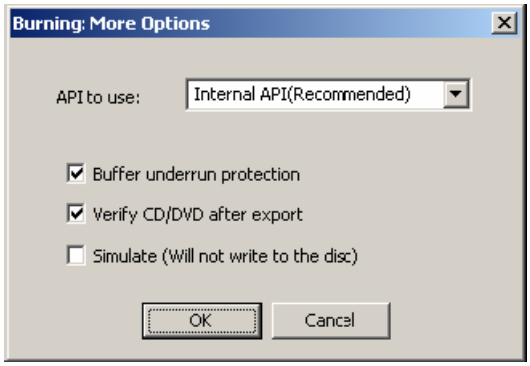
– **IMAPI**

Refer to User Limitations for Burning CD/DVD on page 144 for more information about which API to use.

15. On the Burning: More Options window, select the following as desired:
    – **Buffer underrun protection**—Selecting this option helps to prevent errors when burning a CD/DVD but increases the time it takes for the burn process to complete.
    – **Verify CD/DVD after export**—Selecting this option verifies that the contents of the CD/DVD where burned correctly but increases the time it takes for the burn process to complete.
    – **Simulate (will not write to the disc)**—Select this option to make a test run of the burn process.



16. Click **OK** to close the Burning: More Options window.
17. In the **When the burning operation is complete** section, select the following as desired:
    – **Bring window to the top**
    – **Display a message**
    – **Eject the disk**
18. In the **When the burned CD is inserted** section, select the following as desired:
    – **Open all the studies in the Viewer**
    – **Browse studies and reports**

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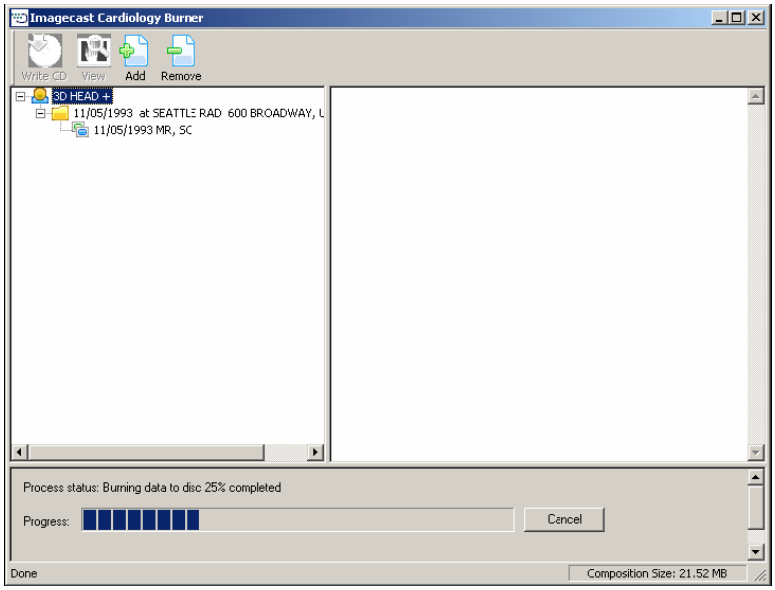
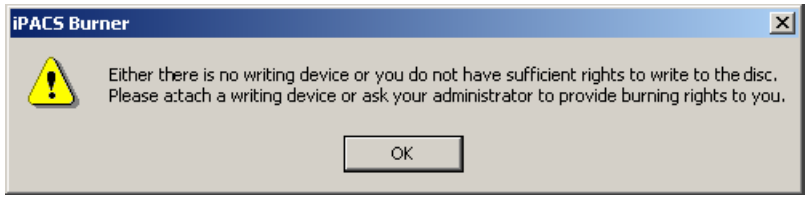
19. Click **Burn** to start burning/creating the CD/DVD.

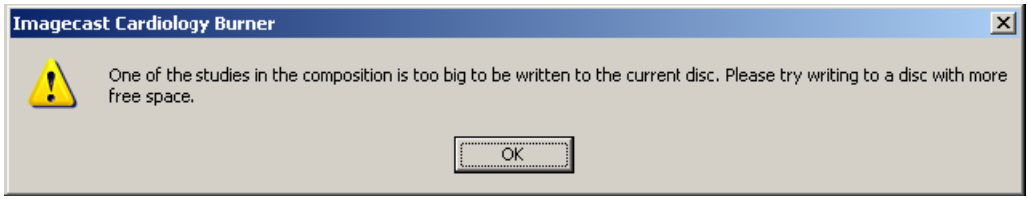


The images are burned on a CD/DVD along with the autorun viewer. This viewer has limited capabilities and optional features are not included.

If there is no writing device on the local computer, you will get the following message:



If the size of the study is greater than the entered media, you will get the following error message:



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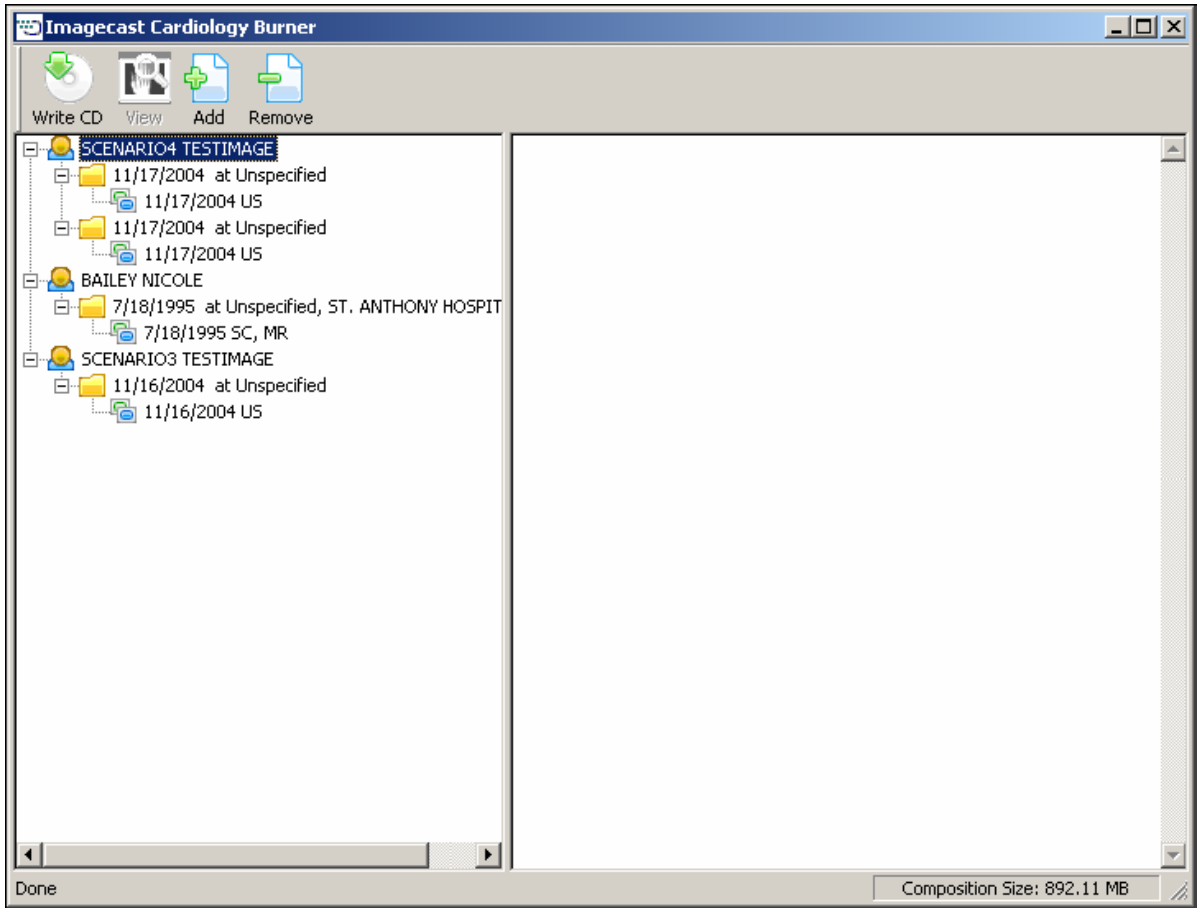
How to Burn to Multiple Disks

If you have several studies, and together they are greater in size than the entered media, you will have the option of splitting the studies into several discs.



You can see the Composition Size in the lower right hand corner of the screen.

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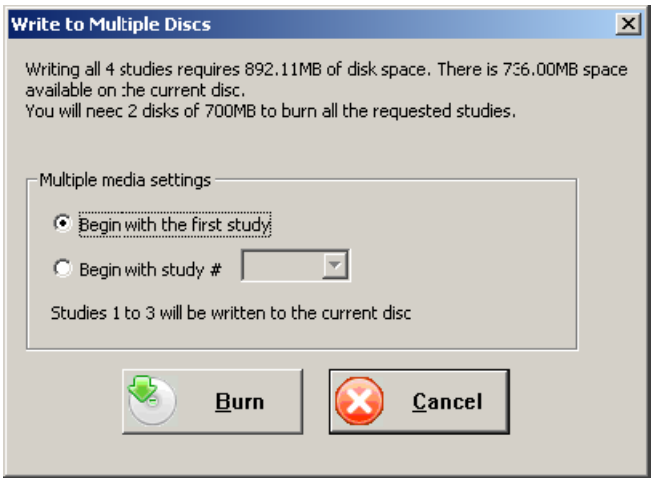
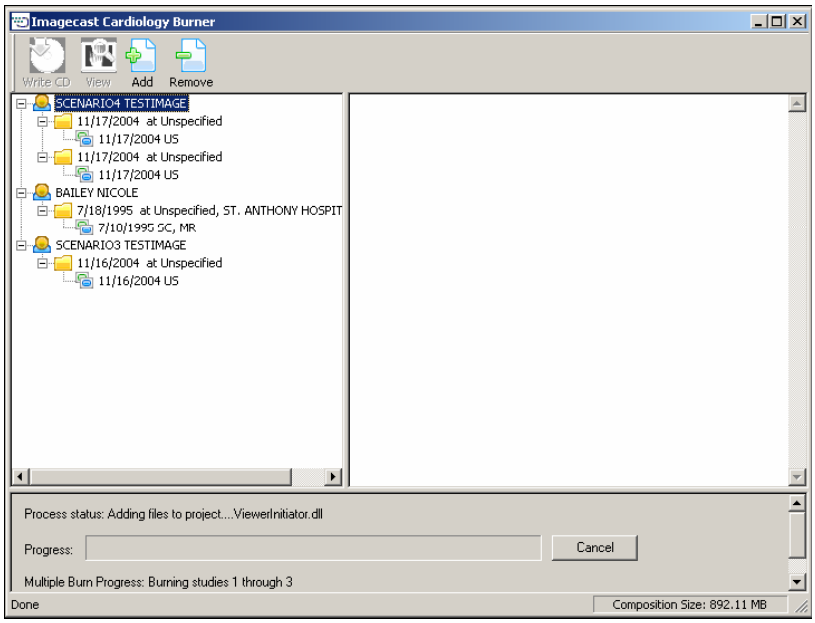
If the total size of the studies is more than the capacity of the media (CD/DVD), the following window appears:



Select the multiple media settings:

- Begin with the first study
- Begin with study number

Click **Burn** to start the burning process of the first disc.



The burner cannot split one study in two CD discs. For Example, if there is a single study that is greater than 650MB, then the user can burn this study only on DVD.

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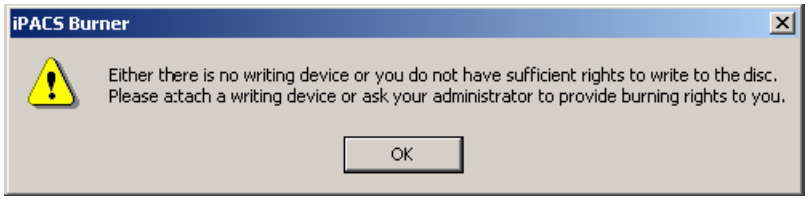
User Limitations for Burning CD/DVD

Allowing Windows Restricted User to Burn CD/DVD

By default, only users with MS Windows Administrator privileges will have access to burning CDs/DVDs from the iPACS Viewer. However, there are two ways restricted users can be given access for burning CDs/DVDs.

If a Restricted user tries to do media export using the default CD/DVD burner options then a message will be displayed to the user:



User can try one of the following options, for a Windows Restricted user to be able to do Media Export.

Temporary Solution (Valid for Single Session)

This method has the following restrictions:

- The user can only burn a single CD at a time. The multiple CD scenario will not be supported.
- The user will be able to burn DVD only with Windows XP SP2 (previous versions don't support Windows IMAPI for DVD Burn).
- The Windows IMAPI method is less reliable than the default method, thus the user is more likely to experience an error during the burn process.

As a Windows Restricted User

1. Click **Write CD**.
2. The Burn Options window opens.
3. Click **More Options** button.
4. The Burning: More Options window opens.

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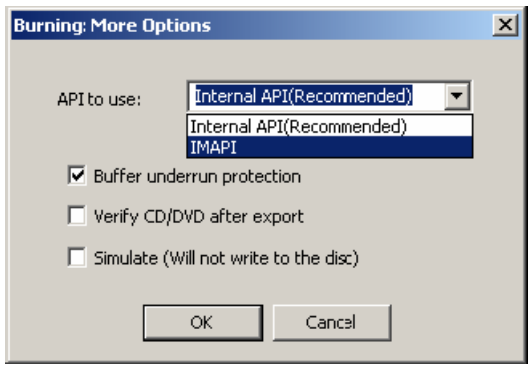
5. Select API to use as IMAPI, which will allow the restricted user to burn to CD/DVD.



Permanent Solution

This method has the following restrictions:

- Autorun/Autoplay is disabled on the computer for all the users and for any disc
- The burning API provided in Windows XP (IMAPI) cannot be used. This means restricted users can NOT burn DVDs.

To Change the Local Security Policy for CD Drive Access to All Users on a Machine

This method allows all restricted users on that machine to burn CDs.

1. Login as an Administrator.
2. Double-check on the file AccessCD.reg (Usually found at the installation folder of the Viewer.)
3. Restart the computer.
4. Log in as a restricted user, now you should be able to burn CDs.

To Undo this Change

1. Login as an administrator.
2. Double-click on the file UnaccessCD.reg (Usually found at the installation folder of the Viewer.)
3. Restart the computer.

DVD Drive/Disc Compatibility Table

The below table describes the DVD Discs supported by a specific DVD Drives. This explains why you cannot burn some disks in some systems.

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DVD Discs Supported by a Specific DVD Drive:

	DVD–RW Drive	DVD+RW Drive	DVD±R/RW Drive	DVD±R/RW DL Drive
DVD–R Disc	Reads & writes	Reads	Reads & writes	Reads & writes
DVD–RW Disc	Reads & writes	Reads	Reads & writes	Reads & writes
DVD+R Disc	Usually reads	Reads & writes	Reads & writes	Reads & writes
DVD+RW Disc	Usually reads	Reads	Reads & writes	Reads & writes
DVD+R DL Disc	Usually reads	Reads	Reads	Reads & writes

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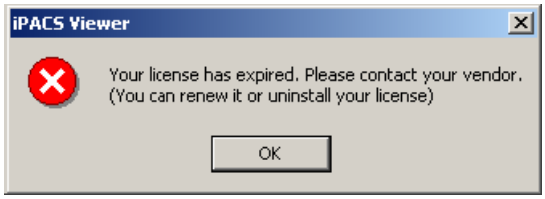
Local License

Not required when the viewer is used as part of the Imagecast PACS for Cardiology.

There is an option in the Viewer to install a local license. This license is used to enable certain license dependent features of the Viewer.

To install a local license:

1. Click **Help** > **License** > **Install License**.
2. Browse to the location of the License.dat file, as provided by your administrator, and click Open.
3. If the license is up to date and suitable for your computer, the success message will be shown.
4. If the local license has expired, the following message is received:



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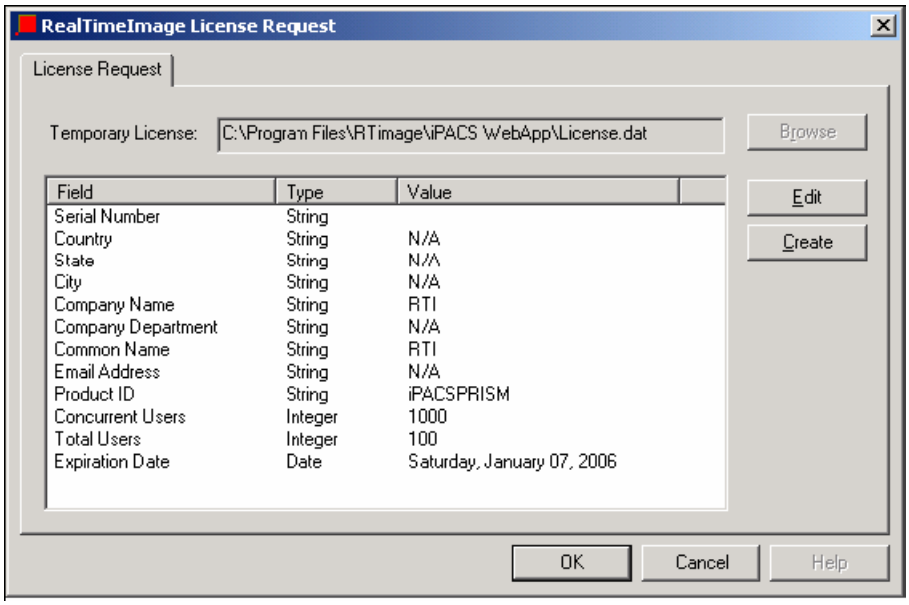
Create License Request

Not required when the viewer is used as part of the Imagecast PACS for Cardiology.

Create a permanent license request. After the permanent license request has been created, it must be sent to your system administrator, in order to receive a permanent license for the iPACS Viewer.

1. Select **Help** > **License** > **Create License Request**.
2. The License Request application opens. Double click on the fields to edit them.



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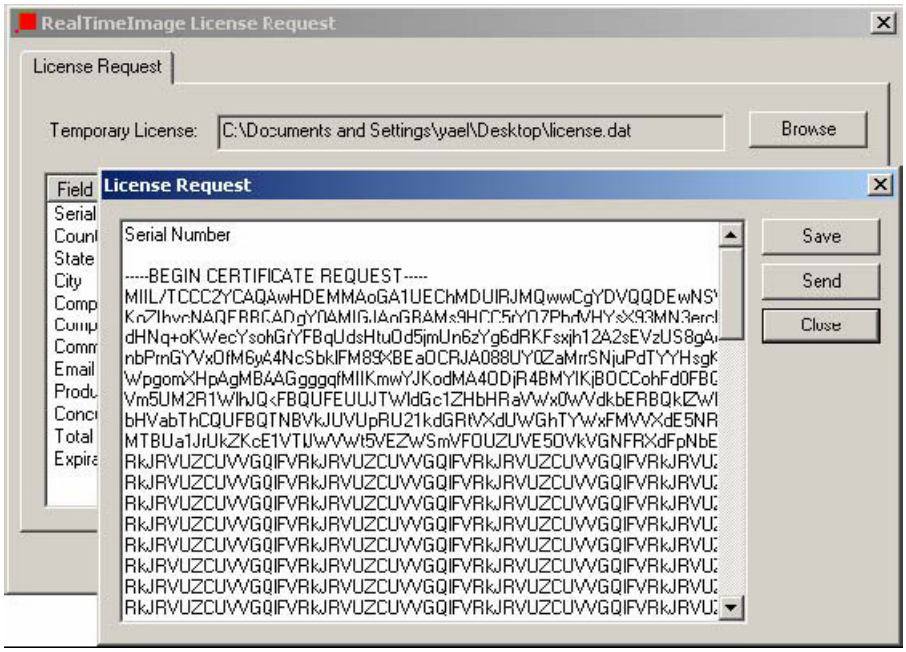
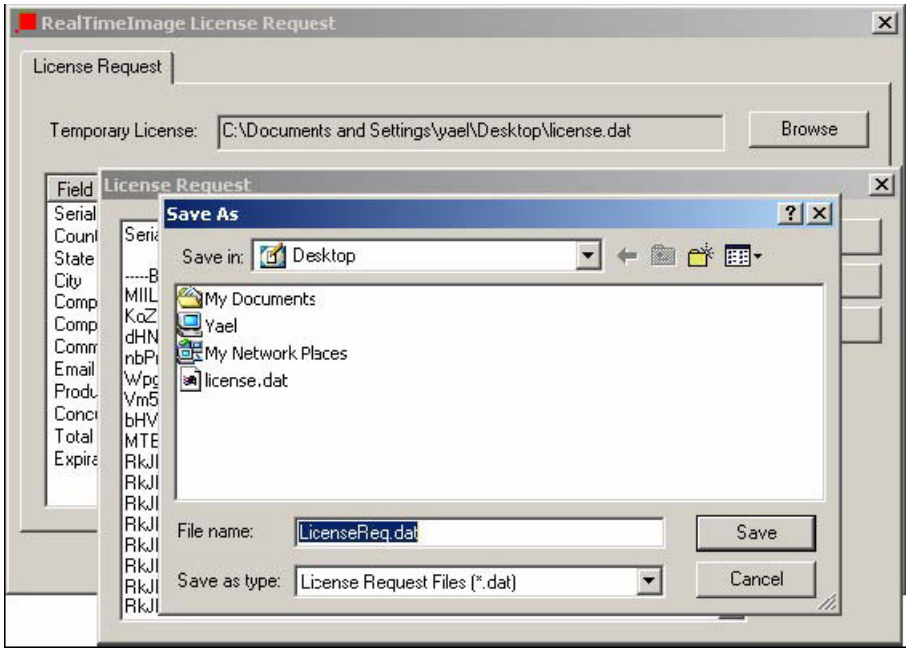
3. Click **Create** to create a permanent license request.



4. Click **Save** in order to save the permanent License Request and send it later.



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Keyboard Shortcuts

Keyboard Shortcuts (Page 1 of 2)

Command	Keyboard Shortcut	Comments
Display and Image Manipulation		
Magnifinder	M	
Zoom In	+	
Zoom Out	–	
Restore Image	R	
Activate new view	TAB	On main view, left to right
Invert Color	I	
1:1 resolution	1	
Fit to Screen	2	
Full Screen	ENTER	
Show/Hide Overlays	A	
Windowing Presets	F2—F12	
Windowing Tool	W or C	
Multi Monitor Display	Y	
Turn Off Active Tool	ESC	
Navigation		
Go to First Images	G or HOME	
Go to Last Image	END	
Next Page	PAGE UP	
Previous Page	PAGE DOWN	
Next Series	N	
Previous Series	P	
Next Series— Single	• Down Arrow • Right Arrow • Mouse Wheel Down	

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Keyboard Shortcuts (Page 2 of 2)

Command	Keyboard Shortcut	Comments
Navigation (continued)		
Previous Series—Single	• Up Arrow • Left Arrow • Mouse Wheel Up	
Next Line—Sequence	• Down Arrow • Right Arrow • Mouse Wheel Down	
Previous Line—Sequence	• Up Arrow • Left Arrow • Mouse Wheel Up	
Cine Shortcuts		
Play/Pause	SPACE BAR	
Increase Speed	Right Arrow	
Decrease Speed	Left Arrow	
Stop	S	
Switch Playback Order	BACKSPACE	
Show/Hide Cine Speed Bar	D	
Step Backward	B	For cardio cine
Step Forward	F	For cardio cine
Menu		
Open File	CTRL+O	
Print File	CTRL+P	
DICOM Print	CTRL+D	
Save File	CTRL+S	
Settings	CTRL+T	
Show Hide Menu Bar	CTRL+M	
Copy to Clipboard	CTRL+C or Insert	
Study Report	CTRL+R	
Help	F1	Opens the manual

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